

**Environmental Impact Statement for
Proposed Demolition and
Environmental Cleanup Activities at
Santa Susana Field Laboratory,
Ventura County, California**

Prepared for
National Aeronautics and Space Administration

July 2013

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2011 Supplemental Biological Surveys of NASA-Administered Property at Santa Susana Field Laboratory

**National Aeronautics and Space Administration
Huntsville, Alabama**

December 2011

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Acronyms and Abbreviations

Boeing	The Boeing Company
Cal-IPC	California Invasive Pest Plant Council
CDFA	California Department of Food and Agriculture
CDFG	California Department of Fish and Game
CNDDDB	California Natural Diversity Data Base
CNPS	California Native Plant Societies
EIS	Environmental Impact Statement
ENTS	Laboratory Engineered Natural Treatment Systems
ESA	Endangered Species Act
°F	Degree Fahrenheit
ft	Feet
GIS	Geographic information system
GPS	global positioning system
LOX	Liquid oxygen
NAD	North American Datum
NASA	National Aeronautics and Space Administration
NRCS	Natural Resources Conservation Service
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
SAIC	Science Applications International Corporation
SSFL	Santa Susana Field Laboratory
SSURGO	Soil Survey Geographic Database
USFWS	U.S. Fish and Wildlife Service
WRCC	Western Regional Climate Center

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SECTION 1

Introduction

This report presents the findings of special-status plant species and wildlife surveys conducted in 2011 on the National Aeronautics and Space Administration (NASA)-administered property at Santa Susana Field Laboratory (SSFL) in southern California. SSFL was established shortly after World War II and has been used primarily as a site to develop and test nuclear reactors, rockets, and missiles. The 2,850-acre site is divided into four production and two buffer areas (Areas I, II, III, and IV, and the northern and southern buffer zones). A portion of SSFL is federally owned property that is administered by NASA. The remaining property at SSFL is owned by The Boeing Company (Boeing). The NASA-administered property at SSFL consists of 41.7 acres within Area I and all 409.5 acres of Area II. The Boeing Company owns the remainder of Area I, all of Areas III and IV, and the northern and southern buffer areas at the site.

1.1 Purpose

This report presents the results of protocol-level botanical surveys and opportunistic wildlife surveys of the NASA-administered property at SSFL. These biological surveys were conducted to support NASA's preparation of a Ecological Stewardship Plan for the property it administers at SSFL. The findings also will be used as the basis for the biological resources section of the Environmental Impact Statement (EIS) being prepared to assess the potential impacts of NASA's proposal to demolish structures and to remediate soil and groundwater on the NASA-administered property at SSFL. This report has been prepared as a supplement to the *Fall 2010 Habitat and Listed Species Surveys of NASA-Administered Property at Santa Susana Field Laboratory* (NASA, 2011).

1.2 Background

In April 2008 and May 2009, ecological surveys were conducted on portions of the NASA-administered property at SSFL as part of Resource Conservation and Recovery Act (RCRA) Facility Investigations (RFIs) (NASA, 2008; 2009a; 2009b). The fall 2010 habitat and listed species surveys (NASA, 2011) together with the 2011 botanical and wildlife surveys are intended to expand on the past ecological surveys through a survey of the entire NASA-administered property at SSFL, including some limited areas outside the RFI areas that had not been surveyed previously.

Several other ecological studies conducted at SSFL between 2005 and 2009 were reviewed for potential insight into the biological resources on the NASA-administered property:

- MWH Americas, Inc., and AMEC Earth & Environmental, Inc. (2005)
- MWH Americas, Inc., and ERM (2007)
- Ogden Environmental and Energy Services Co., Inc. (1998)
- Padre Associates, Inc. (2008)
- Science Applications International Corporation (SAIC) (2009)

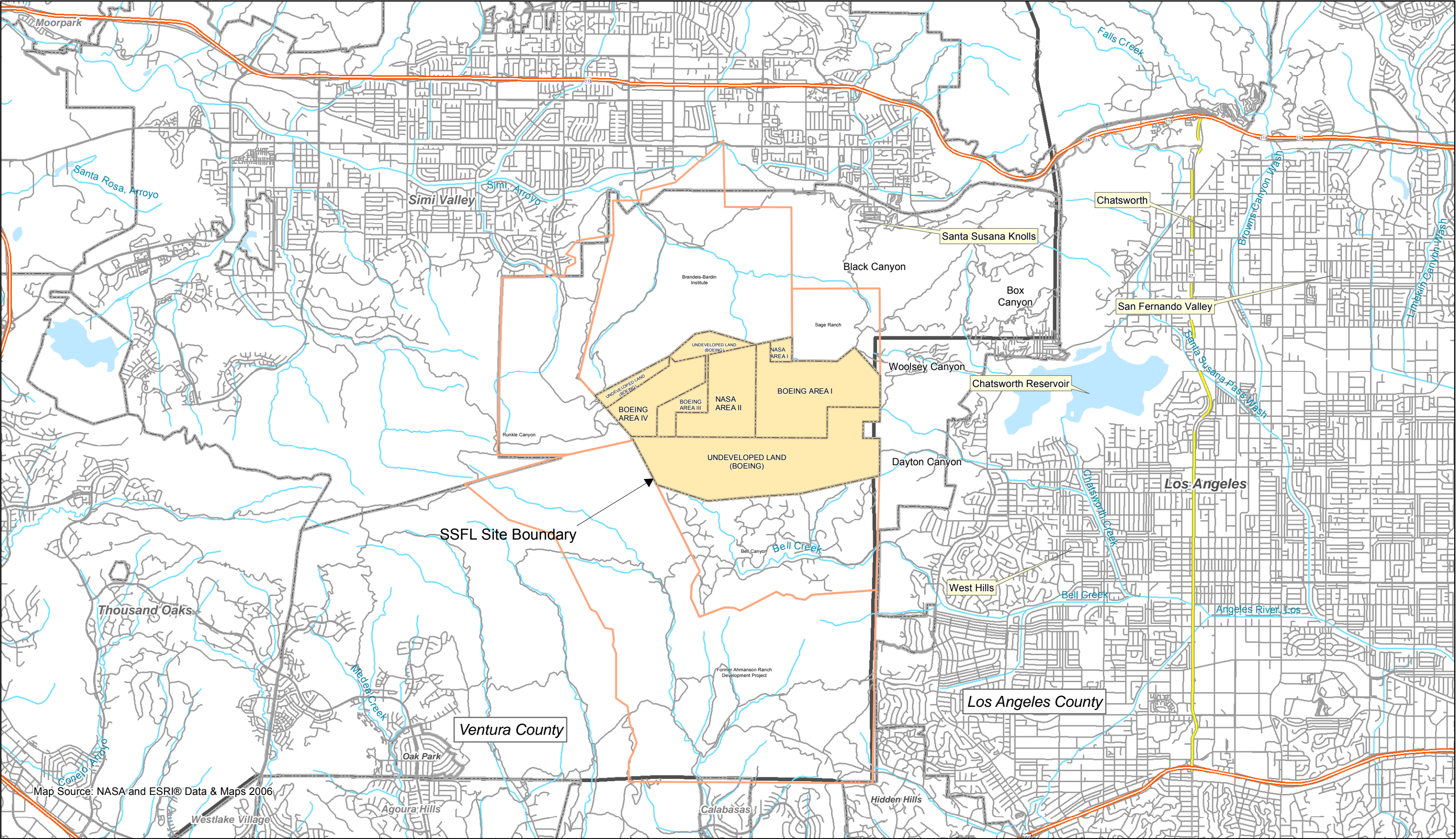
1.3 Location and Environmental Setting

Section 1.3 is summarized from a more detailed environmental setting description contained in the *Fall 2010 Habitat and Listed Species Surveys of NASA-Administered Property at Santa Susana Field Laboratory* (NASA, 2011). Additional information regarding physiography, geology, and habitat types also is included in that report.

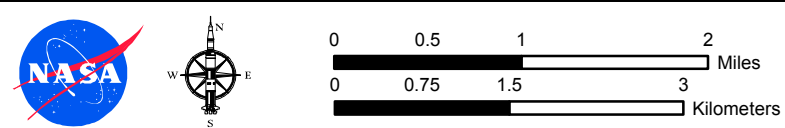
1.3.1 General

SSFL is approximately 29 miles northwest of downtown Los Angeles in the southeastern corner of Ventura County, California. SSFL is located mostly within an unincorporated part of Ventura County; its easternmost portion extends slightly into an unincorporated part of Los Angeles County (Figure 1-1). It encompasses 2,850 acres within a remote, mountainous area near the crest of the Simi Hills at the western border of the San Fernando Valley.

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Map Source: NASA and ESRI® Data & Maps 2006



Map Document: O:\NASA\SSFL\maps\EIS_2011\BioSurvey_Spring2011\SSFL_Regional.mxd

18-Oct-2011
Drawn By:
A. Cooley

Figure 1-1
Regional Map
NASA Supplemental Biological Survey – 2011
Santa Susana Field Laboratory
Ventura County, California

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Area I LOX Plant and Area II are in the central and north-central parts of SSFL, respectively (Figure 1-2). The 451.2 acres of the NASA-administered property at SSFL represents approximately 16 percent of the total site area.

SSFL's landscape is characterized by sandstone outcropping hills. Numerous industrial facilities, constructed drainage systems, and roadways have been developed within this hilly landscape. The site is within the central portion of the Southern California Coast ecological subregion in the Simi Valley–Santa Susana Mountains (261Be) ecological subsection. This subsection includes steep mountains; moderately steep to steep hills; and nearly level to gently sloping floodplains, terraces, and alluvial fans (Miles and Goudey, 1998).

1.3.2 Habitat Types

Habitat surveys of the NASA-administered property conducted during fall 2010 identified eight natural terrestrial habitat types, two aquatic habitat types, and ruderal and developed areas (NASA, 2011). These habitat types are described briefly in the following text. Table 1-1 cross-references the mapped habitat types and the current California vegetation classification system (Sawyer et al., 2009).

Chaparral

Chaparral is the most abundant and widespread natural community at the site. This habitat covers 172.6 acres (approximately 38 percent) of the NASA-administered property. Characteristic species include chamise (*Adenostoma fasciculatum*), hoaryleaf ceanothus (*Ceanothus crassifolius*), black sage (*Salvia mellifera*), laurel sumac (*Malosma laurina*), thicketleaf yerba santa (*Eriodictyon crassifolium*), Mendocino bushmallow (*Malacothamnus fasciculatus*), and chaparral yucca (*Yucca whipplei*). The abundance of these species is variable within this habitat type depending on soils, aspect, past disturbance, and other environmental factors.

Venturan Coastal Sage Scrub

Venturan coastal sage scrub covers 64.4 acres (approximately 15 percent) of the site. Characteristic species include coastal sagebrush (*Artemisia californica*), Eastern Mojave buckwheat (*Eriogonum fasciculatum* var. *fasciculatum*), black sage, chaparral yucca, thicketleaf yerba santa, and common deerweed (*Acmispon glaber*).

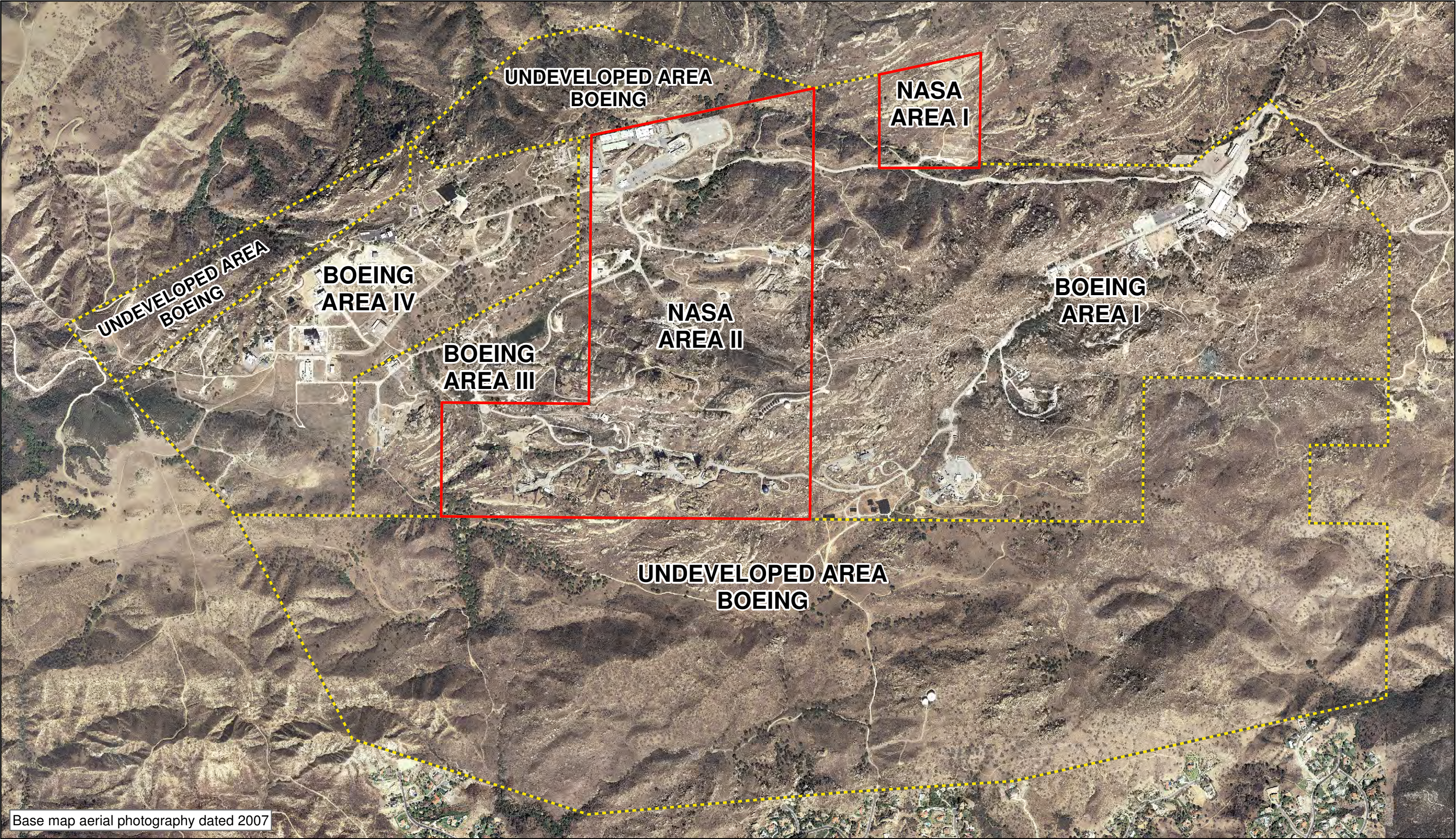
Non-native Grassland

Grassland habitat covers 19.2 acres (approximately 4 percent) of the site and often occurs in a mosaic with other habitat types. Most of the grasslands are characterized by slender oat (*Avena barbata*), intermixed with other introduced annual grasses such as ripgut brome (*Bromus diandrus*), soft brome (*Bromus hordeaceus*), and fescue (*Vulpia* spp). Native grasses including needlegrass (*Nassella* spp.), littleseed muhly (*Muhlenbergia microsperma*), and deergrass (*Muhlenbergia rigens*) are present in a few areas, but generally provide only minimal cover. Common herbaceous species include suncup (*Camissonia* spp.), winecup clarkia (*Clarkia purpurea*), longbeak stork's bill (*Erodium botrys*), and winter vetch (*Vicia villosa*).

Coast Live Oak Woodland

Coast live oak woodland is distributed widely across the site but only makes up 13.2 acres (approximately 3 percent) of the NASA-administered property. This habitat is characterized by mature coast live oak (*Quercus agrifolia*) trees. The understory generally consists of annual grasses such as ripgut brome and slender oat, with occasional native grasses including blue wildrye (*Elymus glaucus*) and California brome (*Bromus carinatus*). The understory shrub layer is poorly developed and, where present, generally consists of scattered Pacific poison oak (*Toxicodendron diversilobum*).

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Base map aerial photography dated 2007



02-Dec-2011
Drawn By:
A. Cooley

0 750 1,500 3,000
Feet

Legend

- NASA-Administered Property Boundary
- SSFL Administrative Areas

Figure 1-2
Site Overview
NASA Supplemental Biological Survey – 2011
Santa Susana Field Laboratory
Ventura County, California

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TABLE 1-1

Mapped Habitat Types and Current California Vegetation Classification System

NASA SSFL 2011 Supplemental Biological Surveys of NASA-Administered Property at Santa Susana Field Laboratory

Mapped Natural Habitat Types	Current California Vegetation Classification System ¹
Chaparral	<i>Adenostoma fasciculatum</i> – <i>Salvia mellifera</i> Shrubland Alliance <i>Malosma laurina</i> Shrubland Alliance <i>Malacothamnus fasciculatus</i> Shrubland Alliance <i>Eriodictyon crassifolium</i> Provisional Shrubland Alliance
Venturan Coastal Sage Scrub	<i>Artemisia californica</i> – <i>Eriogonum fasciculatum</i> Shrubland Alliance
Non-Native Grassland	<i>Avena</i> (<i>barbata</i> , <i>fatua</i>) Semi-Natural Herbaceous Stands
Coast Live Oak Woodland	<i>Quercus agrifolia</i> Woodland Alliance
Coast Live Oak Riparian Forest	<i>Quercus agrifolia</i> Woodland Alliance
Baccharis Scrub	<i>Baccharis pilularis</i> Shrubland Alliance
Mule-fat Scrub	<i>Baccharis salicifolia</i> Shrubland Alliance
Southern Willow Scrub	<i>Salix lasiolepis</i> Shrubland Alliance

Note:

SSFL = Santa Susana Field Laboratory

¹ Sawyer et al. (2009)

Coast Live Oak Riparian Forest

Coast live oak riparian forest is found along the edges of the seasonal streams on the site. This habitat type covers 9.2 acres (approximately 2 percent) of the NASA-administered property. The composition of this community is generally similar to the coast live oak woodland habitat described previously, although the understory typically is more diverse in these areas and includes species such as Douglas' sagewort (*Artemisia douglasiana*), creeping snowberry (*Symphoricarpos mollis*), and American black elderberry (*Sambucus nigra*).

Baccharis Scrub

Baccharis scrub is limited, covering only 2.6 total acres (less than 1 percent) of the site. This community is characterized by generally pure stands of coyotebrush (*Baccharis pilularis*). In these areas, coyotebrush ranges from dense cover with a sparse herbaceous layer to more open stands with an understory composed of annual grasses and scattered forbs.

Mule-fat Scrub

Mule-fat scrub is limited, covering 2.1 acres (less than 1 percent) of the site. This habitat type is characterized by localized, dense stands of mule-fat (*Baccharis salicifolia*).

Southern Willow Scrub

Southern willow scrub habitat on the NASA-administered property is characterized by arroyo willow (*Salix lasiolepis*) intermixed with occasional red willow (*Salix laevigata*) and narrowleaf willow (*Salix exigua*). This habitat type is uncommon on the site, covering only 1 acre (less than 1 percent). Southern willow scrub occurs in localized patches around scattered ponds and detention basins and along portions of the seasonal drainages within the site.

Aquatic Habitats

Aquatic habitats identified on the NASA-administered property include 0.4 acre of open water and 0.2 acre of freshwater marsh habitat associated with various ponds and detention basins. Freshwater marsh is limited to the outer edges of ponds and detention basins and is characterized by southern cattail (*Typha domingensis*).

Sandstone Rock Outcrops

Approximately 91 acres (20 percent) of the NASA-administered property is composed of sandstone outcrops. In many areas, the outcrops are devoid of vegetation, while in other areas, the rocks are covered with a diverse assemblage of lichens. In some areas, scattered vascular plants are present. Common plants associated with these rock outcrops include bushy spikemoss (*Selaginella bigelovii*), lanceleaf liveforever (*Dudleya lanceolata*), chalk dudleya (*Dudleya pulverulenta*), cliffbrake (*Pellaea* spp.), orange bush monkey flower (*Mimulus aurantiacus*), and Santa Susana tarweed (*Deinandra minthornii*).

Ruderal

Ruderal habitat is common around developed areas and areas that have been subject to human disturbance. Ruderal habitats cover approximately 17 acres (4 percent) of the site. Common species observed in these areas include telegraphweed (*Heterotheca grandiflora*), black mustard (*Brassica nigra*), Maltese star-thistle (*Centaurea melitensis*), silver bird's-foot trefoil (*Acmispon argophyllus*), stork's bill (*Erodium* spp.), and common deerweed.

Developed

Developed areas include paved roads, parking areas, buildings, test structures, and other developments. Approximately 58 acres, or 13 percent, of the NASA-administered property have been developed.

1.3.3 Soils

Three Natural Resources Conservation Service (NRCS) soil types occur within the NASA-administered property (NRCS, 2008). These soil types are described in the following text; Figure 1-3 shows their distribution on the property.

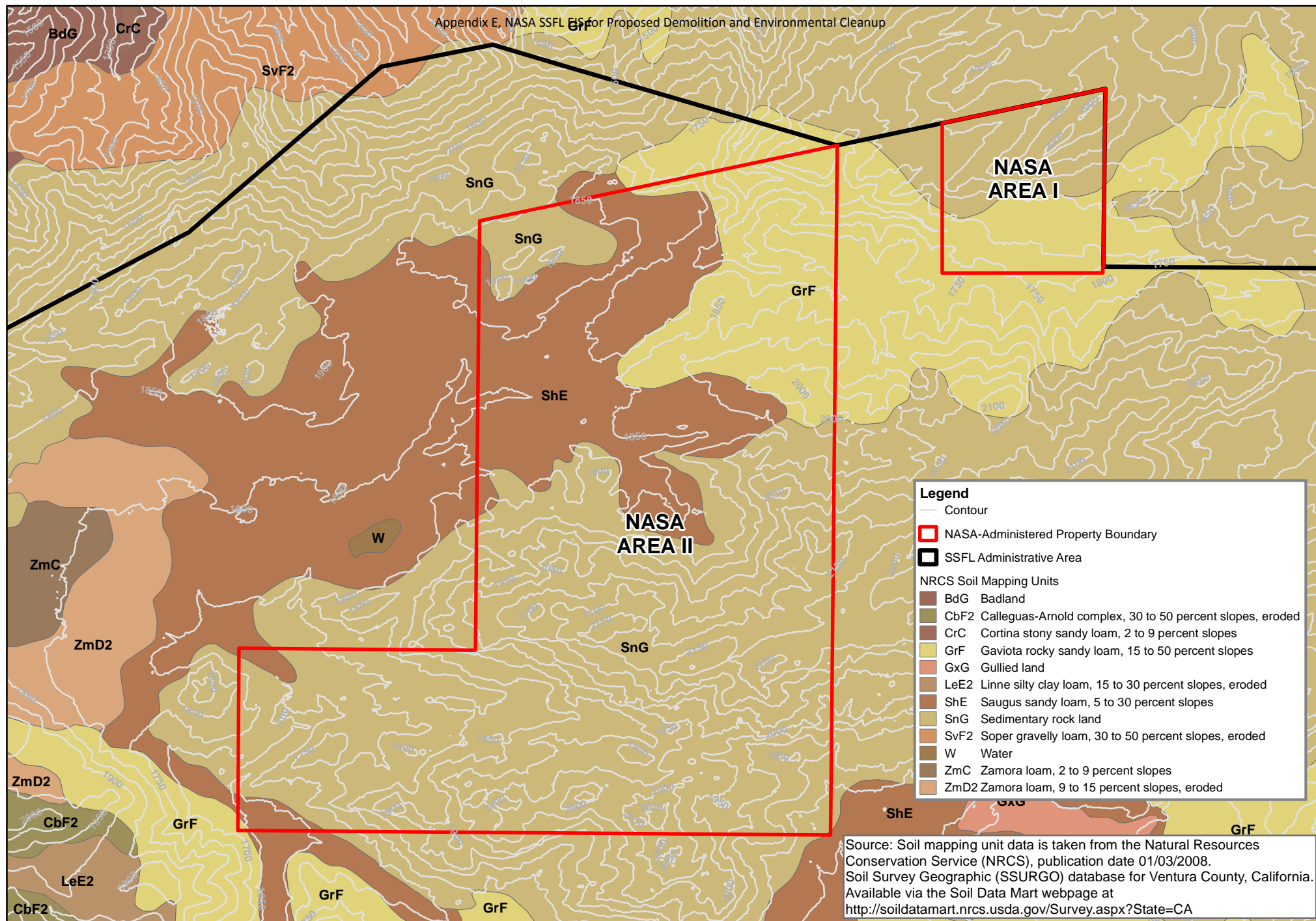
GrF—Gaviota rocky sandy loam, 15- to 50-percent slopes. This soil mapping unit occurs in the southern half of NASA Area I and in the northeastern corner of Area II. These soils are found on hills and mountains and have a very shallow or shallow to lithic (bedrock) contact. They are well to excessively well drained and are formed in material weathered from hard sandstone or meta-sandstone. These soils have very low to very high runoff and moderately rapid permeability.

ShE—Saugus sandy loam, 5- to 30-percent slopes. This soil mapping unit occurs in the northwestern and southwestern portions of Area II. This unit consists of deep, well-drained soils that formed from weakly consolidated sediments. They are found on dissected terraces and foothills. These soils have medium to rapid runoff and moderate permeability.

SnG—Sedimentary rock land. This soil mapping unit occurs in the northern half of NASA Area I and in the northwestern corner and southern half of Area II. This mapping unit consists mostly of exposed sedimentary rock with very thin, discontinuous areas of soil. There is little available information about this mapping unit; however, the potential for erosion is expected to be relatively low, based on the erosivity factors reported online and the relative lack of soil cover. It is expected that runoff is rapid and permeability is very low in these areas.

1.3.4 Climate Summary

Climate data from the Western Regional Climate Center (2011) Canoga Park area, which is approximately 7 miles southeast of SSFL, is considered generally representative of the regional climate for the site. Average temperatures range from a low of 39 degrees Fahrenheit (°F) in December and January to a high of 95°F in July and August. Average annual rainfall is 16.8 inches, most of which falls between November and March.



0 500 1,000 Feet
0 150 300 Meters

06-Dec-2011
Drawn By:
A. Croley
E-17

Figure 1-3
NRCS Soil Mapping Units
NASA Supplemental Biological Survey - 2011
Santa Susana Field Laboratory
Ventura County, California

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SECTION 2

Methods

2.1 Botanical Surveys

2.1.1 Pre-field Preparation

Preparation for the protocol-level special-status plant surveys included compiling a list of rare, threatened, or endangered plant species that have the potential to occur within the limits of the NASA-administered property at SSFL. For the purpose of this evaluation, a special-status plant is defined as any species that falls under one of the following classifications:

- Federally listed as threatened or endangered by the U.S. Fish and Wildlife Service (USFWS) under the Endangered Species Act (ESA)
- A candidate for federal listing under the ESA
- Listed threatened or endangered by the California Department of Fish and Game (CDFG) under the California Endangered Species Act
- Listed as rare under the California Native Plant Protection Act
- Considered rare, threatened, or endangered in California as determined by the California Native Plant Societies (CNPS) Rare Plant Inventory

The list of special-status plant species that potentially could occur on the NASA-administered property at SSFL was developed based on information from the California Natural Diversity Database (CNDDDB) (CDFW, 2011b); CNPS (2011) Rare Plant Inventory; USFWS list of threatened, endangered, and candidate species for Ventura County (USFWS, 2011); and information from herbarium collections from the Jepson Online Interchange for California Floristics (University of California, 2011). The CNDDDB and CNPS database searches included the following U.S. Geological Survey Quadrangles—Simi, Santa Susana, Oat Mountain, Thousand Oaks, Calabasas, Canoga Park, Point Dume, Malibu Beach, and Topanga.

The database searches and literature review identified 46 special-status plant species in the regional vicinity, 34 of which were considered to have the potential to occur on the NASA-administered property (Table 2-1). Appendix A contains a list of special-status plants identified in the data review that are considered unlikely to occur on the site.

Representative photographs of many of the special-status plant species were obtained from the Internet (CalPhotos, 2011) to facilitate field identification. Flowering periods provided by the CNPS Rare Plant Inventory (CNPS, 2011) were used to schedule field work to correspond with the appropriate blooming periods for the special-status plant species.

Ortho-rectified, 150-scale (1 inch = 150 feet [ft]) aerial photographs with overlain survey area boundaries were prepared as the base maps for the field surveys. These aerial photograph base maps were generated from the NASA geographic information system (GIS) database using the North American Datum (NAD) 1927 State Plane, California Zone V base datum coordinate system. Habitat mapping developed during the fall 2010 survey (NASA, 2011) also was overlain onto the base maps.

TABLE 2-1

Special-Status Plant Species that Potentially Occur on the NASA-administered Property at SSFL

NASA SSFL 2011 Supplemental Biological Surveys of NASA-Administered Property at Santa Susana Field Laboratory

Scientific Name	Common Name	Status	Blooming Period	Habitat and Notes
<i>Asplenium vespertinum</i>	western spleenwort	4.2	Feb-June	Rocky areas in chaparral, cismontane woodland, and coastal scrub. Herbarium collection from Lake Sherwood area, approximately 10 miles southwest of the site.
<i>Astragalus brauntonii</i>	Braunton's milk-vetch	FE 1B.1	Jan-Aug	Chaparral, coastal scrub grassland, and closed-cone coniferous forest. Known to occur on Boeing-administered property at SSFL approximately 0.5 mile west of the site. Numerous reported occurrences in the regional vicinity.
<i>Atriplex parishii</i>	Parish's brittle-scale	1B.1	June-Oct	Alkali meadows, vernal pools, chenopod scrub, and playas; usually found on drying alkali playas with fine soils. Limited suitable habitat on the site. The nearest reported occurrence is around Santa Monica, approximately 18 miles southeast of the site.
<i>Baccharis malibuensis</i>	Malibu baccharis	1B.1	Aug	Coastal scrub, chaparral, and oak woodland habitats. Several reported occurrences approximately 8 to 10 miles south of the site.
<i>Calandrinia breweri</i>	Brewer's calandrinia	4.2	Mar-June	Sandy or loamy soils in chaparral and coastal scrub. Several herbarium collections from Ventura County including the Santa Monica Mountains.
<i>California macrophylla</i>	round-leaved filaree	1B.1	Mar-May	Cismontane woodland and grassland; generally associated with clay soils. Three reported occurrences between 5 and 9 miles south of the site.
<i>Calochortus catalinae</i>	Catalina mariposa lily	4.2	Feb-June	Openings in chaparral, coastal scrub, and cismontane woodland and on grassy slopes. Numerous herbarium collections from Ventura County, including the Santa Monica Mountains.
<i>Calochortus clavatus</i> var. <i>gracilis</i>	slender mariposa lily	1B.2	Mar-June	Chaparral and coastal scrub, often in grassy areas within other habitats. Known to occur on SSFL property. Several additional reported occurrences in the regional vicinity of the site.
<i>Calochortus fimbriatus</i>	late-flowered mariposa lily	1B.2	June-Aug	Chaparral and cismontane woodland; often on serpentine. Three reported occurrences approximately 8 miles north of the site, including one associated with open woodland on sandstone parent material.
<i>Calochortus plummerae</i>	Plummer's mariposa lily	1B.2	May-July	Coastal scrub, chaparral, grassland, cismontane woodland, and lower montane coniferous forests. Known to occur on SSFL property. Numerous reported occurrences in the regional vicinity of the site.
<i>Centromadia parryi</i> ssp. <i>australis</i>	southern tarweed	1B.1	May-Nov	Edges of marshes, vernal pools, and vernal mesic grasslands. Limited suitable habitat present on the site. The only reported occurrence in the vicinity is a historical (1930) herbarium collection from Santa Monica (18 miles to the southeast).

TABLE 2-1

Special-Status Plant Species that Potentially Occur on the NASA-administered Property at SSFL

NASA SSFL 2011 Supplemental Biological Surveys of NASA-Administered Property at Santa Susana Field Laboratory

Scientific Name	Common Name	Status	Blooming Period	Habitat and Notes
<i>Chorizanthe parryi</i> var. <i>fernandina</i>	San Fernando Valley spineflower	FC/CE 1B.1	Apr-July	Sandy soils in coastal scrub and rocky outcrops. Large population reported approximately 3.6 miles south of the site.
<i>Chorizanthe parryi</i> var. <i>parryi</i>	Parry's spineflower	1B.1	Apr-June	Dry sandy soils in coastal scrub, chaparral, and grassland; often at interface with oak woodland habitat. Only document occurrence in the vicinity is a 1957 herbarium collection approximately 14 miles south of the site. This occurrence is possibly extirpated.
<i>Deinandra minthornii</i>	Santa Susana tarweed	CR 1B.2	July-Nov	On sandstone outcrops in chaparral and coastal scrub. This species is widespread throughout much of the site. Numerous reported occurrences in the regional vicinity.
<i>Delphinium parryi</i> ssp. <i>blochmaniae</i>	dune larkspur	1B.2	Apr-May	Coastal dunes and maritime chaparral in dry sandy soils. Only two reported occurrences in vicinity of the site, both are in the coastal hills to the southwest. Nearest reported occurrence is associated with oak woodland habitat approximately 10.5 miles to the southwest of the site.
<i>Dodecahema leptoceras</i>	Slender-horned spineflower	FE/SE 1B.1	Apr-June	Chaparral and coastal scrub. There are no CNDDDB occurrences or herbarium records for this species in Ventura County. Nearest reported occurrence is a historical collection (1893) from Newhall, approximately 13 miles northeast of the site. There is also an occurrence (possibly extirpated) approximately 17 miles east northeast of the site.
<i>Dudleya blochmaniae</i> ssp. <i>blochmaniae</i>	Blochman's dudleya	1B.1	Apr-June	Coastal scrub, grassland, and open rocky slopes; often in clay soil over serpentine or in rocky areas with little soil. Known to occur on SSFL (Boeing property). Other reported occurrence in the vicinity of Chatsworth Reservoir approximately 3 miles east of the site.
<i>Dudleya cymosa</i> ssp. <i>agourensis</i>	Agoura Hills dudleya	FT 1B.2	May-June	Rocky areas and volcanic breccias in chaparral and cismontane woodland habitats. Several known occurrences between 6 and 10 miles southwest of the site.
<i>Dudleya cymosa</i> ssp. <i>marcescens</i>	marcescent dudleya	FT/CR 1B.2	Apr-July	Chaparral, sheer rock surfaces, and rocky volcanic cliffs. Four reported occurrences between 8 and 9 miles south of the site.
<i>Dudleya cymosa</i> ssp. <i>ovatifolia</i>	Santa Monica dudleya	FT 1B.2	Mar-June	Chaparral and coastal scrub; often on north facing slopes in canyons associated with sedimentary conglomerates. Three known occurrences between 10 and 12 miles south of the site.
<i>Dudleya multicaulis</i>	many-stemmed dudleya	1B.2	Apr-July	Chaparral, coastal scrub and grassy slopes; often in heavy clay soils. Known to occur at SSFL (Boeing property). One reported CNDDDB occurrence from a rocky outcrop approximately 3.5 miles east of the site.

TABLE 2-1

Special-Status Plant Species that Potentially Occur on the NASA-administered Property at SSFL

NASA SSFL 2011 Supplemental Biological Surveys of NASA-Administered Property at Santa Susana Field Laboratory

Scientific Name	Common Name	Status	Blooming Period	Habitat and Notes
<i>Dudleya parva</i>	Conejo dudleya	FT 1B.2	May-June	Coastal scrub, grassland and rocky slopes; generally on clayey or volcanic soils. Two reported occurrences approximately 9 miles west of the site.
<i>Dudleya verityi</i>	Verity's dudleya	FT 1B.2	May-June	Volcanic and rocky outcrops in chaparral, coastal scrub, and cismontane woodland. Three reported occurrences between 15 and 19 miles west of the site.
<i>Eriogonum crocatum</i>	conejo buckwheat	CR 1B.2	Apr-July	Rocky areas in coastal scrub and grasslands. One reported occurrence approximately 10 miles southwest of the site.
<i>Harpagonella palmeri</i>	Palmer's grapplinghook	4.2	Mar-May	Chaparral, coastal scrub, and grassland; often on clay soils. One reported occurrence approximately 13 miles northeast of the site.
<i>Horkelia cuneata</i> ssp. <i>puberula</i>	mesa horkelia	1B.1	Feb-Sept	Sandy or gravelly sites in chaparral, cismontane woodlands, and coastal scrub. Several herbarium collections from Ventura County. All CNDDDB occurrences are more than 30 miles to the west northwest of the site.
<i>Lasthenia glabrata</i> ssp. <i>coulteri</i>	Coulter's goldfields	1B.1	Feb-June	Coastal salt marshes, playas, grasslands, and vernal pools; usually associated with alkaline soils in playas, sinks, and grasslands. Limited suitable habitat on the site. Two reported occurrences in the vicinity of the site. One is a 1933 herbarium collection approximately 13 miles south, near the Malibu lagoon. The other is approximately 4.5 miles east of the site, but the habitat and taxonomy of this occurrence are questionable.
<i>Navarretia fossalis</i>	spreading navarretia	FT 1B.1	Apr-June	Vernal pools, shallow freshwater marshes, playas, and chenopod scrub. Limited habitat present on the site. No reported occurrences in Ventura County. Nearest reported occurrences are between 19 and 20 miles northeast of the site.
<i>Nolina cismontana</i>	chaparral nolina	1B.2	May-July	Chaparral and coastal scrub; primarily on sandstone and shale substrates. Three reported occurrences within 3 to 6 miles west to southwest of the site.
<i>Pentachaeta lyonii</i>	Lyon's pentachaeta	FE/CE 1B.1	Mar-Aug	Chaparral and grassland habitats. Numerous reported occurrences of this species in the regional vicinity of the site. Nearest CNDDDB occurrence is approximately 6.5 miles west of the site.
<i>Phacelia hubbyi</i>	Hubby's phacelia	4.2	Apr-June	Gravelly and rocky areas in coastal scrub, chaparral, and grassland habitats. Several herbarium collections from Ventura County, including the Santa Susana Mountains.
<i>Phacelia ramosissima</i> var. <i>australitoralis</i> ¹	south coast branching phacelia	3.2	Mar-Aug	Sandy or rocky sites in coastal scrub, chaparral, coastal dunes, and in coastal salt marshes. Herbarium records suggest that this variety is typically found in more coastal areas.

TABLE 2-1

Special-Status Plant Species that Potentially Occur on the NASA-administered Property at SSFL

NASA SSFL 2011 Supplemental Biological Surveys of NASA-Administered Property at Santa Susana Field Laboratory

Scientific Name	Common Name	Status	Blooming Period	Habitat and Notes
<i>Pseudognaphalium leucocephalum</i>	white rabbit-tobacco	2.2	July-Dec	Sandy gravelly sites in coastal scrub, chaparral, riparian woodlands and cismontane woodland habitats. Known to occur on SSFL property.
<i>Thelypteris puberula</i> var. <i>sonorensis</i>	Sonoran maiden fern	2.2	Jan-Sept	Along streams, seeps, and in mesic meadows. One reported occurrence in a seepage area along a stream approximately 15 miles southwest of the site.

Notes:

CNDDDB = California Natural Diversity Database

SSFL = Santa Susana Field Laboratory

¹ *Phacelia ramosissima* var. *australitoralis*—This variety is no longer recognized and is now considered a synonym for *Phacelia ramosissima*, according to the Jepson Online Interchange for California Floristics (University of California, 2011).

Status Codes:

CE = State listed endangered species

CR = State listed rare species

FC = Candidate for federal listing as a threatened or endangered species

FE = Federally listed endangered species

FT = Federally listed threatened species

1B.1 = California Native Plant Society (CNPS) listed as rare, threatened, or endangered in California and elsewhere; considered seriously threatened in California.

1B.2 = CNPS listed as rare, threatened, or endangered in California and elsewhere; considered fairly threatened in California.

2.2 = CNPS listed as rare, threatened, or endangered in California and elsewhere; but more common elsewhere, considered fairly threatened in California.

3.2 – Plants about which more information is needed; a review list; considered fairly threatened in California.

4.2 – Plants of limited distribution; a watch list; considered fairly threatened in California.

Sources:

CNDDDB RareFind Version 3.1.0 (CDFG, 2011b).

Online CNPS Inventory of Rare and Endangered Plants (8th Edition) (CNPS, 2011)

Threatened and Endangered Plants of Ventura County (USFWS, 2011)

Berkeley Consortium of California Herbaria (University of California, 2011)

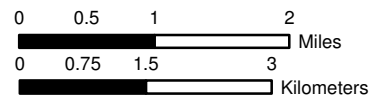
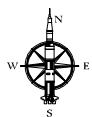
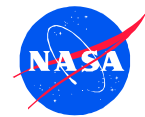
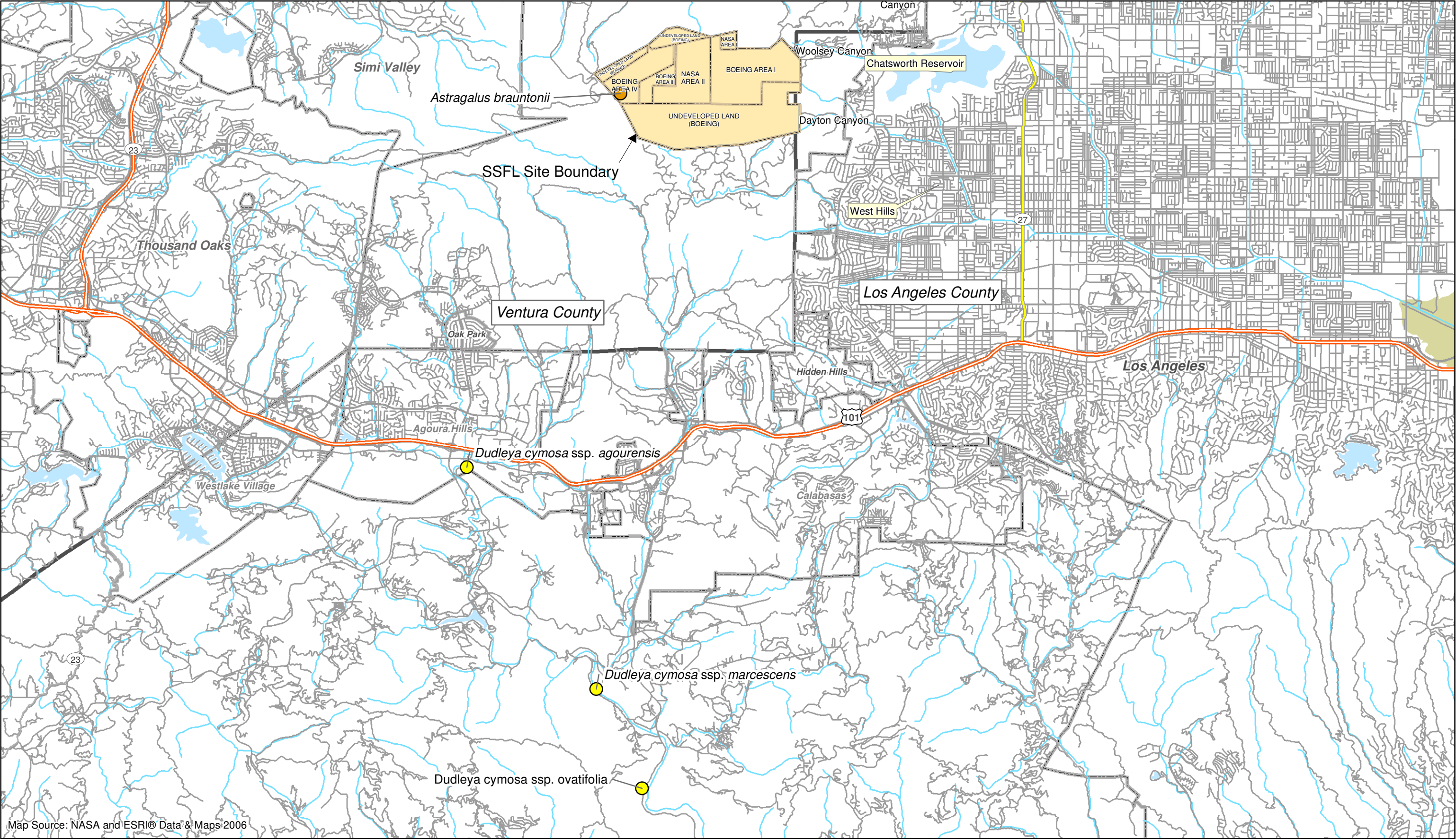
2.1.2 Reference Populations

Reference sites for four special-status plants were visited prior to or during the field surveys. Reference populations provide information about the current phenology, assist with proper identification of target species, and confirm that both the timing and environmental conditions are suitable for conducting the botanical surveys. Given the large number of potentially occurring plants, it was impractical to observe reference populations for all the target species. Imprecise location information, uncertainty of population status, distance from the site, and restricted access to private property also precluded visits to some reference locations.

The following reference sites were visited on the dates indicated; Appendix B provides photographs of reference populations.

Braunton's milk-vetch (*Astragalus brauntonii*): A large number of individuals on a previously burned, north-facing hillside were observed on April 18, June 6, and August 15, 2011. This population is within the southern portion of Boeing Area IV (coordinates 34° 13' 34.58788" N; -118° 43' 00.34798" W), as shown in Figure 2-1. Plants were viewed in different development stages (budding, flowering, and fruiting) over the course of the three site visits.

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Figure 2-1
Special Status Plant Reference Locations
NASA Supplemental Biological Survey – 2011
Santa Susana Field Laboratory
Ventura County, California

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Agoura Hills Dudleya (*Dudleya cymosa* ssp. *agourensis*): A large number of individuals were viewed on a north-facing rock slope on Cornell Road south of Agoura Hills on June 7, 2011 (coordinates 34° 08' 29.33165" N; -118° 45' 28.64898" W), as shown in Figure 2-1. The sandy-rocky slope was a road cut that exposed a former volcanic mud flow. Plants were viewed in flowering condition.

Marcescent Dudleya (*Dudleya cymosa* ssp. *marcescens*): Approximately 12 individuals were observed on an east-facing rock slope within Malibu Creek State Park approximately 2.9 miles south of State Highway 101 off Coastal Highway N1 (Malibu Canyon Road) on June 7, 2011 (coordinates 34° 05' 29.36678" N; -118° 43' 19.91690" W), as shown in Figure 2-1. The rock slope is adjacent to a dirt roadway and hiking trail and partially covered with moss and lichens. Plants were viewed in flowering condition.

Santa Monica Mountains Dudleya (*Dudleya cymosa* spp. *ovatifolia*): Numerous individuals were observed on a northeast-facing rocky slope along a small creek 5.4 miles south of State Highway 101 off Coastal Highway N1 (Malibu Canyon Road) on June 7, 2011 (coordinates 34° 04' 08.80759" N; -118° 42' 34.32287" W), as shown in Figure 2-1. The rock slope is a volcanic mud flow covered with mosses and lichens. Plants were viewed in flowering condition.

In addition to these rare plant reference locations, a site that had Palmer's Dudleya (*Dudleya palmeri*) was viewed on June 7, 2011, to observe the diversity of characteristics of this genus.

2.1.3 Field Surveys

The 2011 botanical field surveys were completed by Russell Huddleston, Steve Long, Gary Santolo, and Laurel Karren. The surveys were conducted in accordance with the USFWS botanical survey guidelines (1996), CDFG (2009), and CNPS (2001).

Field surveys were scheduled to capture the temporal variations in the occurrence of special-status plants. Surveys were conducted during the following periods: April 18 to 22, June 6 to 10, and August 15 to 20, 2011. Tarja Sagar, a botanist with the National Park Service's Santa Monica Mountains National Recreation Area, provided local expertise on plant identification and assisted with the botanical surveys on June 7, 2011. Surveys of the NASA-administered property involved more than 488 person hours.

The survey area included the entire NASA-administered property at SSFL. The field surveys were conducted via systematic walking. Because of the steep rugged terrain and impenetrable dense vegetation in some areas, transects were not used for all areas of the site. In areas where terrain, slope, or dense vegetation constrained access, observations were made from adjacent, safely accessible locations. The surveys were floristic in nature and the plant species observed were identified to the taxonomic level necessary to assess their conservation status. Appendix C includes the list of observed plant species observed. Samples of plants that could not be identified readily in the field were collected for later identification using taxonomic keys. Taxonomic keys and the following local flora and field guides were used to identify plant species in the field and from collected samples: the *Jepson Manual* (Hickman, 1993); *Flora of the Santa Ana River and Environs* (Clarke, et al., 2006); *Wildflowers of the Santa Monica Mountains* (McAuley, 1996); and *Flowering Plants: The Santa Monica Mountains, Coastal and Chaparral Regions of Southern California* (Dale, 1986). Appendix D contains representative photographs of special-status plants, sensitive habitat, and selected wildlife species observed during the survey. Special-status plant occurrences were recorded in the field using a Trimble Geo-XT global positioning system (GPS) device.

2.1.4 Sensitive Habitat Types

Sensitive habitats on the NASA-administered property at SSFL were evaluated based on the 2010 fall habitat mapping and descriptions (NASA, 2011). The status of the natural habitat types identified on the site was determined based on the current list of natural communities from the Vegetation Classification and Mapping Program (CDFG, 2011a). Habitat types assigned a rank of S1, S2, or S3 were considered high-priority conservation habitats. Habitat types ranked as S4 and S5 were not considered priority conservation types (CDFG, 2011a).

2.1.5 Noxious and Invasive Weeds

The 2011 surveys did not include detailed assessments or mapping of noxious and invasive weeds on the site; however, noxious and invasive weed species and their general locations were recorded as part of the floristic surveys. A noxious weed is a plant that has been defined as a pest plant by law or regulation, and for the purpose of this report, included any species listed by the California Department of Food and Agriculture (CDFA) as a noxious weed (2011). Invasive weeds include species that present an economic or ecological threat, but that are not subject to legal regulations. Invasive species include any plant with a high or moderate threat level, as identified by the California Invasive Pest Plant Council (CAL-IPC) (2011).

2.2 Wildlife Surveys

Opportunistic wildlife surveys were conducted concurrently with the special-status plant surveys. Direct observations, calls, and signs of wildlife (butterflies, amphibians, reptiles, birds, and mammals) were recorded during the field surveys. Searches under logs, rocks, and debris were conducted in limited cases where circumstances permitted. Binoculars were used to search for raptor nests on steep rocky cliffs, test stands, and other constructed structures. No protocol-level surveys were conducted, and wildlife observations were opportunistic rather than systematic, although the timing of the surveys presented the best opportunity for multiple seasonal observations. The locations of significant wildlife observations such as nest sites and special-status species sighted during the surveys were recorded by GPS (where accessible) or on aerial photographs (inaccessible locations). Potential habitat for aquatic species such vernal pool crustaceans and amphibians also was recorded during the surveys. Features such as potential seasonal wetlands and sandstone basins that have adequate size and structure to potentially hold enough water during the wet season to support aquatic biota were mapped with GPS. Appendix E contains a list of the wildlife species observed.

SECTION 3

Results

This section presents the findings of the 2011 surveys. Pertinent findings of the fall 2010 survey also are presented for context.

3.1 Special-Status Plant Species

No federal- or state-listed threatened or endangered plant species were observed on the NASA-administered property during the 2011 surveys. Santa Susana tarweed (*Deinandra minthornii*), which is listed as rare under the California Native Plant Protection Act, is widespread and abundant throughout much of the site. Two other plants included in the CNPS Rare Plant Inventory—slender mariposa lily (*Calochortus clavatus* var. *gracilis*) and Plummer’s mariposa lily (*Calochortus plummerae*)—also were observed on the site. Additional information about these occurrences is provided in this section. None of the special-status species of *Dudleya* was observed on the NASA-administered property area during the 2011 surveys.

3.1.1 Santa Susana tarweed (*Deinandra minthornii*)

Santa Susana tarweed is a small leafy shrub in the sunflower family (Asteraceae). This species is listed as rare under the California Native Plant Protection Act as a CNPS 1B.2 (rare, threatened, or endangered in California and elsewhere and considered fairly endangered in California). Shrubs typically range from 1.5 to 3 ft tall and have numerous stiff stems ascending from the base. This plant produces a fragrant resin that makes the stems and leaves sticky. The yellow flower heads occur singly at the ends of the long stems. Blooming generally occurs from July through early November.

During the fall 2010 survey, more than 3,600 Santa Susana tarweeds were identified and mapped on the NASA-administered property (NASA, 2011). The majority of the plants were observed in Area II, where they were widespread throughout the area in association with sandstone outcrops. A total of 324 plants were mapped in Area I; most were found on a sandstone outcrop north of the Liquid Oxygen (LOX) Plant site. The areas containing Santa Susana tarweeds were visited during the 2011 surveys; no changes to the overall distribution were noted.

3.1.2 Slender mariposa lily (*Calochortus clavatus* var. *gracilis*)

Slender mariposa lily is a perennial herb in the lily (Liliaceae) family. Stems are slender and typically between 7 and 12 inches tall with withering basal leaf. The yellow flowers are sparsely hairy with a reddish-brown line above small, shallow nectary. Several plants were observed in small sand pockets associated with dense patches of bushy spikemoss on a sandstone outcrop on the southern side of Skyline Road in Area II (Figure 3-1).

3.1.3 Plummer’s mariposa lily (*Calochortus plummerae*)

Plummer’s mariposa lily is a perennial herb in the lily (Liliaceae) family. The stem generally ranges from 1 to 2 ft tall and is often branched. Basal leaves are generally 8 to 16 inches long, withering later in the season. Leaves along the stem range from 1.5 to 7 inches long and are inrolled toward the ends. The pink to purple flowers are finely toothed with a central ring of long, yellow to orange hairs above the nectary. Two plants were observed in a sandy opening in the chaparral habitat on the western side of the Bravo test stand in Area II (Figure 3-1).

3.2 Sensitive Habitats

Two high-priority conservation natural habitats, as defined by the CDFG (2011a), were identified and mapped on the NASA-administered property during the fall 2010 survey—southern willow scrub and Venturan coastal sage scrub (NASA, 2011). These habitats have been assigned a state ranking of either S2 (community is considered imperiled

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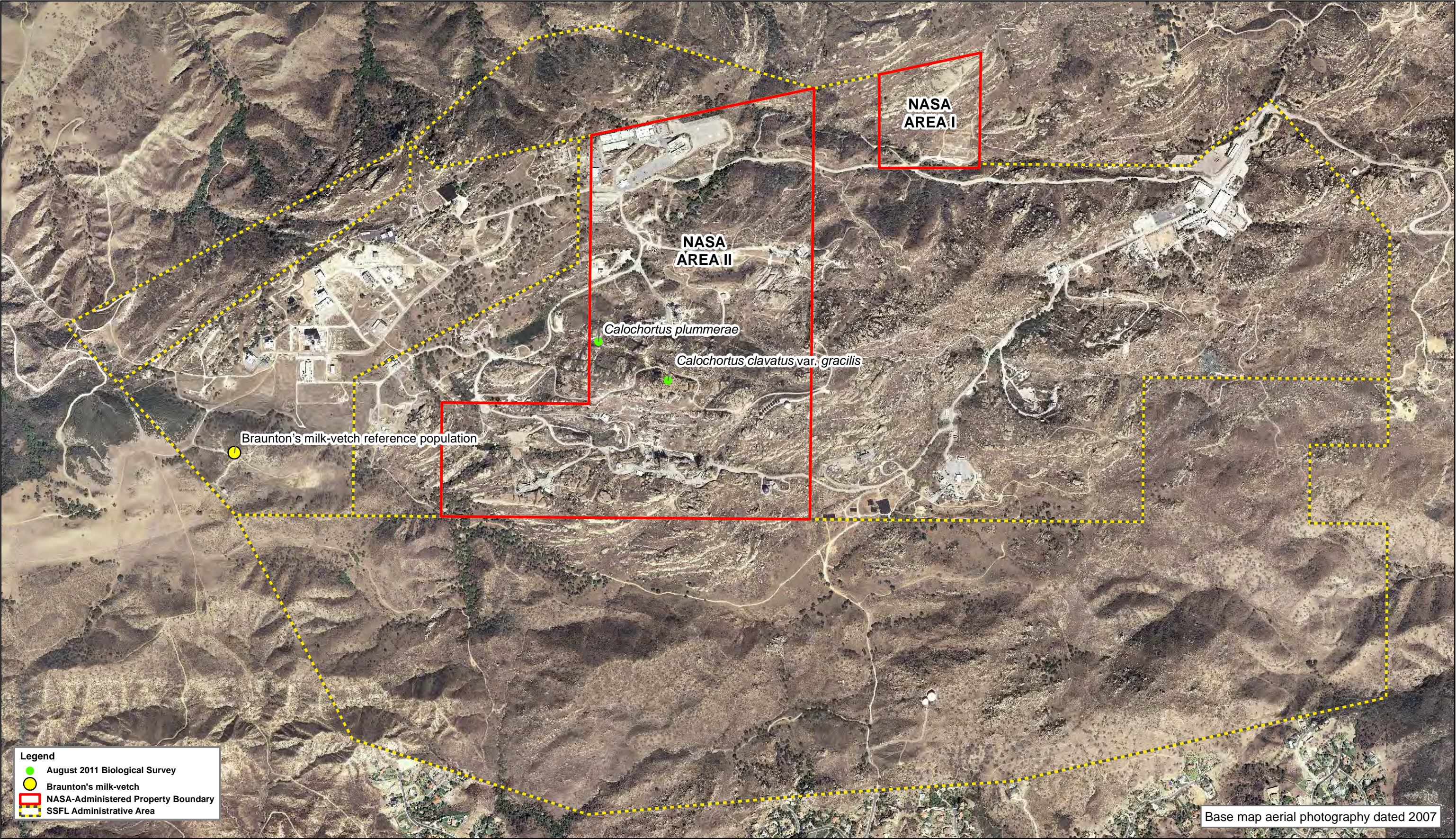
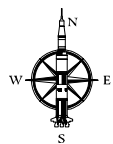


Figure 3-1
Special-Status Plant Locations
NASA Supplemental Biological Survey – 2011
Santa Susana Field Laboratory
Ventura County, California



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due to a restricted range, steep declines, or other factors that make it vulnerable to extirpation from the state), or S3 (the habitat is considered vulnerable with a moderate risk of extirpation due to a restricted range, recent declines, or other factors). Figure 3-2 shows the distribution of sensitive habitat types identified on the NASA-administered property at SSFL.

3.2.1.1 Southern Willow Scrub (S2)

Southern willow scrub, which is relatively limited on the site (1.04 total acres), is associated with seasonal drainages, as well as with more permanent water sources. Small areas of this habitat type were identified in Area II along the drainages north of the Area II landfill and the Coca test stand site, and around the R-2 Ponds and the Coca detention pond. The largest area of southern willow scrub on the NASA-administered property occurs along the drainage on the southern side of the Alfa test stand site (Figure 3-2).

3.2.1.2 Venturan Coastal Sage Scrub (S3)

Venturan coastal sage scrub is widespread throughout the site, covering a total of 64.44 acres. The largest areas of this habitat occur in the southwestern part of Area II. This habitat generally is intermixed with chaparral and rock outcrops (Figure 3-2).

3.3 Noxious and Invasive Weeds

A total of 14 invasive plant species were identified on the NASA-administered property during the 2011 surveys. Five of the species identified are classified by the state as noxious weeds. Table 3-1 lists the noxious and invasive weeds that were identified and the general locations in which they were observed.

3.4 Special-status Animal Species

Five CDFG Species of Special Concern occurrences have been documented by CNDDDB (CDFS, 2011b) within the general vicinity of SSFL—western spadefoot toad (*Spea hammondi*), arroyo toad (*Anaxyrus californicus*), San Diego desert woodrat (*Neotoma lepida intermedia*), tricolored blackbird (*Agelaius tricolor*), and western mastiff bat (*Eumops perotis californicus*). The arroyo toad also is federally listed as endangered.

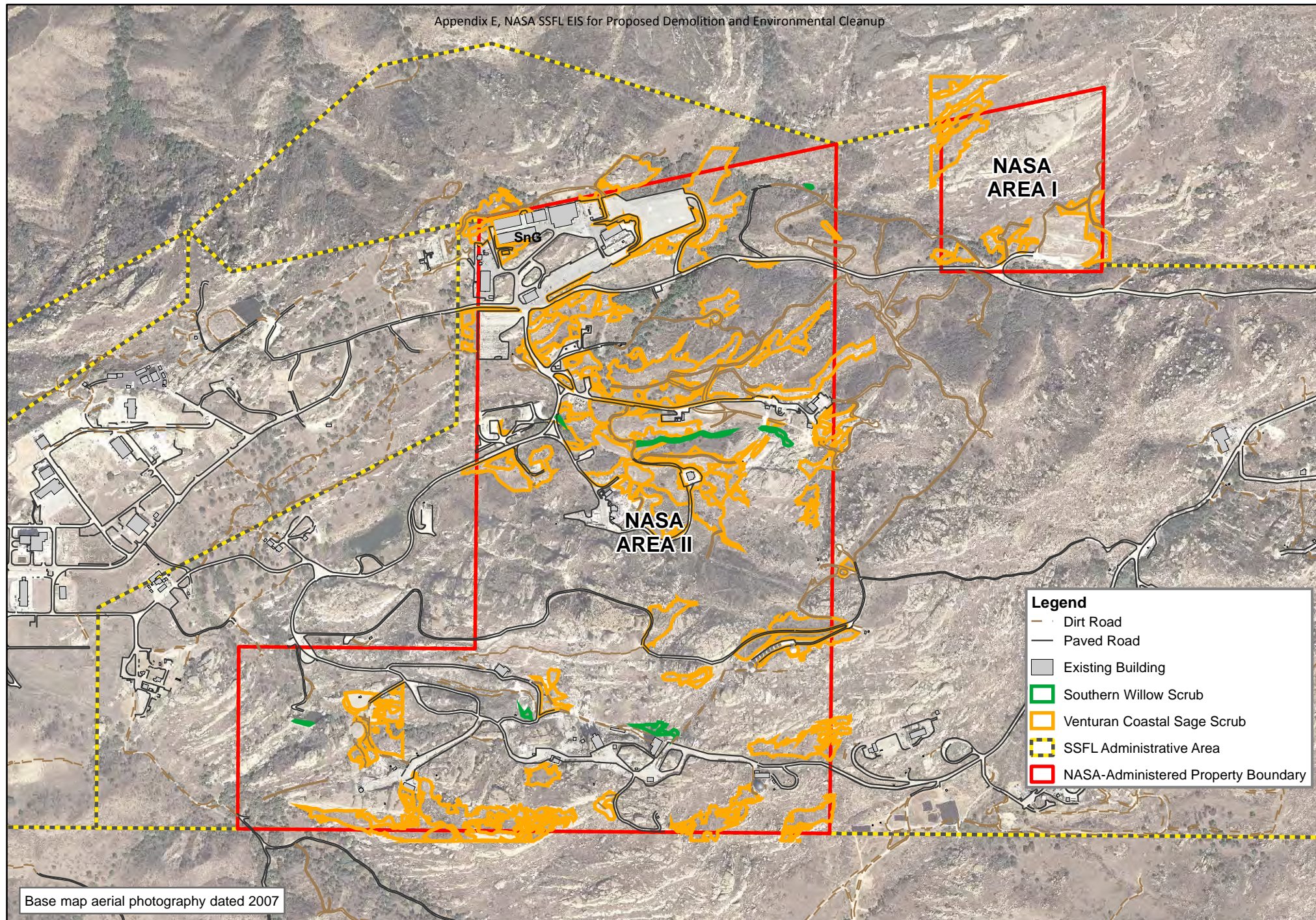
No evidence was found during the 2010 or 2011 surveys indicating the potential occurrence of any of these species, except for the San Diego desert woodrat. Evidence of potential occurrence of woodrat species (woodrat nests and scat) was found during the surveys; however, the species of woodrat on the site was not identified. No species-specific surveys have been conducted.

During the recent EIS public scoping period, USFWS commented that the following federally listed animal species have the potential to occur on the site:

- Quino checkerspot butterfly (*Euphydryas editha ssp. quino*)—Endangered
- Riverside fairy shrimp (*Streptocephalus woottoni*)—Endangered
- Vernal pool fairy shrimp (*Branchinecta lynchi*)—Threatened
- California red-legged frog (*Rana aurora ssp. draytonii*)—Threatened
- Least Bell's vireo (*Vireo bellii ssp. pusillus*)—Endangered
- Coastal California gnatcatcher (*Polioptila californica ssp. californica*)—Threatened

In addition to these species, the federally endangered longhorn fairy shrimp (*Branchinecta longiantenna*) was identified during the 2010 fall survey as having the potential to occur in seasonally inundated pools on rock outcrops on the NASA-administered property (NASA, 2011).

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A. Cooley

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Figure 3-2
Sensitive Natural Communities
NASA Supplemental Biological Survey - 2011
Santa Susana Field Laboratory
Ventura County, California

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TABLE 3-1

Noxious and Invasive Weeds Identified On the NASA-administered Property at SSFL

NASA SSFL 2011 Supplemental Biological Surveys of NASA-Administered Property at Santa Susana Field Laboratory

Scientific Name	Common Name	CDFA	CAL-IPC	Areas Observed
<i>Ailanthus altissima</i>	tree of heaven	C	Moderate	Area II–SPA, Delta and Coca
<i>Brassica nigra</i>	black mustard	--	Moderate	Widespread in grassland habitats, chaparral openings, and disturbed areas throughout the site
<i>Bromus diandrus</i>	ripgut brome	--	Moderate	Common in grasslands and in the understory of oak woodland habitat
<i>Bromus madritensis</i> ssp. <i>rubens</i>	red brome	--	High	Widespread in grasslands and on sandstone outcrops
<i>Carduus pycnocephalus</i>	Italian plumeless thistle	C	Moderate	Locally abundant in grasslands and in the understory of oak woodland habitat
<i>Centaurea melitensis</i>	Maltese star-thistle	C	Moderate	Widespread in grasslands, openings in chaparral, and in disturbed areas
<i>Cirsium vulgare</i>	bull thistle	C	Moderate	Area II–WTC, SPA, Coca, and R9 Pond
<i>Cynodon dactylon</i>	Bermudagrass	--	Moderate	Area II–Coca
<i>Foeniculum vulgare</i>	sweet fennel	--	High	Area II–R9 Pond
<i>Gazania linearis</i>	treasureflower	--	Moderate	Observed in one location south of Skyline road
<i>Mesembryanthemum crystallinum</i>	Common iceplant	--	Moderate	Alfa and Bravo—around developed areas including test stands and buildings.
<i>Pennisetum setaceum</i>	crimson fountaingrass	--	Moderate	Common and widespread, often around developed areas.
<i>Salsola tragus</i>	prickly Russian thistle	C	Limited	Area II–Alfa
<i>Vulpia myuros</i> ssp. <i>myuros</i>	rat-tail fescue	--	Moderate	Common in grassland habitats

Notes:

CDFA = California Department of Food and Agriculture

Cal-IPC = California Invasive Pest Plant Council

SSFL = Santa Susana Field Laboratory

CDFA – List C Noxious weeds

List C includes noxious weeds that are of known economic or environmental detriment and are usually widespread. They are subject to regulations designed to retard spread or to suppress at the discretion of the individual county agricultural commissioner. There is no state enforced action other than providing for pest cleanliness.

CAL_IPC Ratings

High—species that have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.

Moderate—species that have substantial and apparent, but generally not severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.

Limited—species that are invasive but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.

Sources:

California Department of Food and Agriculture, 2011. State List of Noxious Weeds.

California Invasive Pest Plant Council, 2011. Invasive Plant Inventory.

3. RESULTS

Species-specific surveys were not conducted during the 2010 or 2011 surveys for these federally listed wildlife species; however, the potential occurrence of these species on the site was evaluated during the opportunistic wildlife surveys that were conducted.

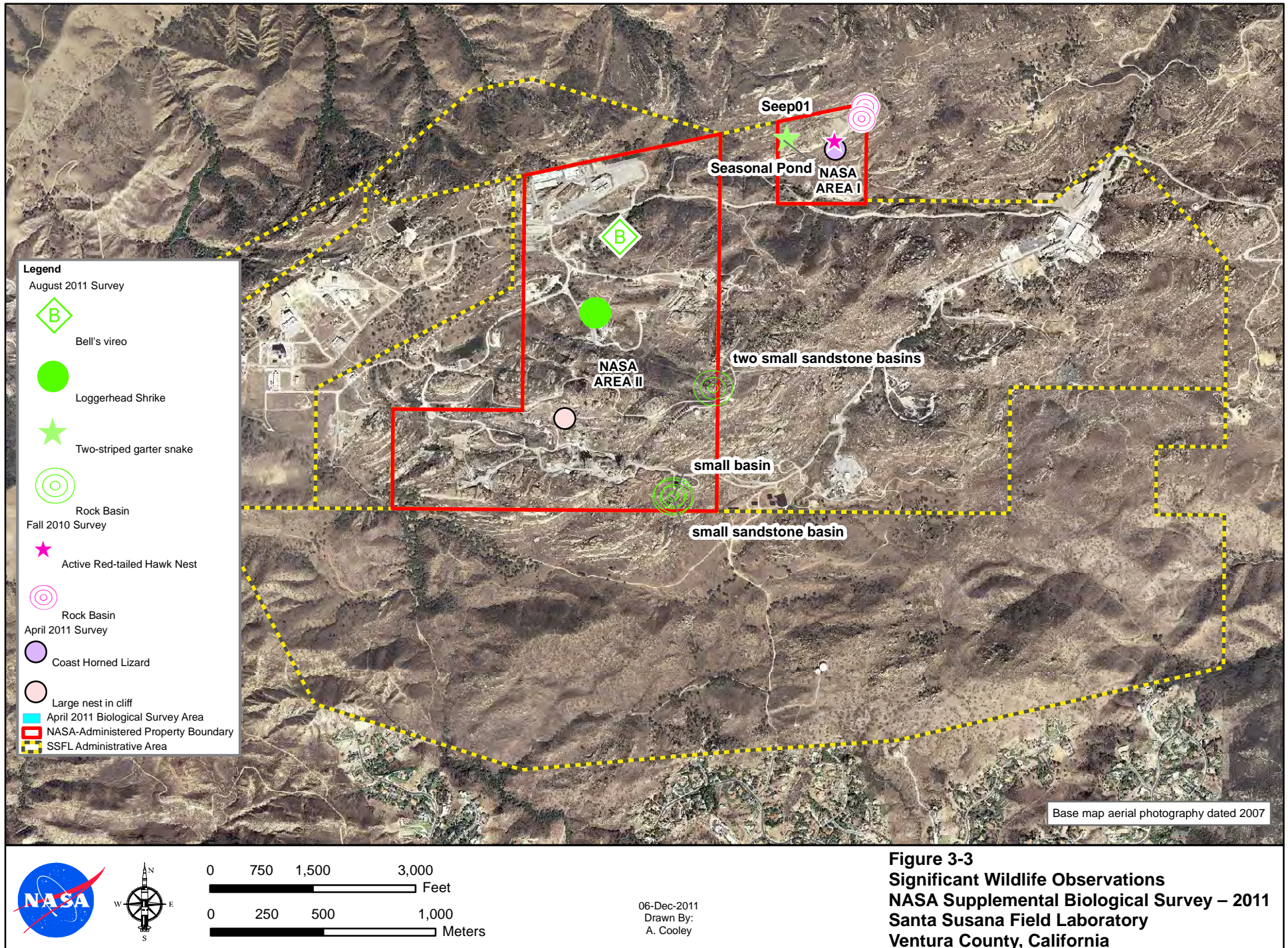
One least Bell's vireo was sighted during the August 2011 survey in coyotebrush adjacent to coast live oak woodland habitat west of the Ash Pile in Area II (Figure 3-3). This sighting occurred outside the typical breeding period of this species (April 10 to July 31); therefore, one explanation for the presence of the bird sighted is that it might have been a transient moving through the area. Mule-fat, a favored plant of the least Bell's vireo, exists on the site; however, the coverage of mule-fat scrub habitat is relatively limited (2.1 total acres) and fragmented. No least Bell's vireos were observed or heard during surveys conducted during their breeding period.

The Quino checkerspot butterfly potentially was sighted on the NASA-administered property during the fall 2010 survey. One individual butterfly that might have been this species was sighted southwest of the Bravo test stand site in mosaic habitat consisting of rock outcrop, non-native grassland, and Venturan coastal sage scrub. The butterfly was observed in flight, and a positive identification was not possible; however, its color, markings, and flight pattern were observed to be similar to those of the Quino checkerspot butterfly. Potential suitable habitat for this species was observed onsite during the 2010 and 2011 surveys. Dotseed plantain (*Plantago erecta*), a potential host plant for this species, was found during surveys conducted in 2011. Other potential food (nectar) plants for the butterfly, including Coulter's snapdragon (*Antirrhinum coulterianum*); California goldfields (*Lasthenia gracilis*); *Cryptantha* spp.; and pinebush (*Ericameria pinifolia*) were also observed during the 2011 surveys. A site assessment for Quino checkerspot butterfly completed by Forensic Entomology Services (2010) in Area IV concluded that the potential for occurrence was very low because the butterfly has not been sighted in Ventura County for more than 70 years and overall habitat at SSFL was considered marginal. A habitat survey for this species is planned within the NASA-administered properties for spring 2012.

One ring-tailed cat (*Bassariscus astutus*) was sighted on a rock outcrop near a riparian drainage northwest of the SPA site during the fall 2010 field surveys. The ring-tailed cat is a California "fully protected" species, which means it cannot be taken or possessed at any time.

The findings of the 2010 and 2011 surveys indicate that potential suitable habitat for the Riverside, vernal pool, and longhorn fairy shrimps exist on the NASA-administered property. Potential habitat includes small rock basins in sandstone outcrops and two seasonally ponded wetland areas. Opportunistic surveys for these species will be done in conjunction with planned wetland delineation fieldwork scheduled for January 2012.

No evidence of California red-legged frog occurrence was found during the 2010 or 2011 surveys. There is limited potential suitable habitat for this frog species on the NASA-administered property, primarily around the R-2 Ponds and the detention basin north of the Coca test stand site. A habitat assessment for California red-legged frog conducted by SAIC (2010) at several locations within SSFL (including the R2-A pond and Outfall 18 on the NASA property) determined that the presence of this species is unlikely. The coastal California gnatcatcher was not observed during the 2010 or 2011 surveys. Small, fragmented populations of gnatcatcher occur in Ventura County in habitat near where sage scrub-grassland interfaces; this species is less likely to be found in habitat where sage scrub grades into chaparral, such as was observed on the site. Dense sage scrub is occupied less frequently than more open sites.



Map Document: O:\NASA\SSFL\maps\EIS_2011\BioSurvey_Spring2011\SSFL_SuppBioSvy_Wildlife.mxd

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The following Species of Special Concern were sighted during the 2010 and 2011 surveys—coast horned lizard (*Phrynosoma coronatum* [blainvillii population]), two-striped garter snake (*Thamnophis hammondi*), and loggerhead shrike (*Lanius ludovicianus*) (Figure 3-3):

- A coast horned lizard was sighted during the spring 2011 survey. Approximately 3 inches long, it was sighted on the LOX Plant site beneath a cliff. Two individuals of this species also were observed during the fall 2010 surveys near the Area II landfill and north of the LOX Plant site in Area I.
- A two-striped garter snake was observed under debris in the seasonal pond northwest of the LOX Plant site during the August 2011 survey.
- A loggerhead shrike was sighted foraging on a hill above the viewing stand at the Bravo test stand site during the August 2011 survey. One individual also was observed during the fall 2010 surveys on the eastern side of the SPA site in Area II.

3.5 Wildlife Observations

Observations of wildlife on the NASA-administered property at SSFL were recorded during the 2010 and 2011 surveys. Appendix E lists the animal species identified on the site via sightings, calls, and other evidence of occurrence. A total of 11 butterfly species, 12 herpetile (reptiles and amphibians) species, 60 bird species, and at least 15 mammal species were identified during the surveys. Numerous common invertebrate species also were observed besides butterflies such as dragonflies and milkweed bugs.

A total of three inactive raptor stick nests were sighted during the fall 2010 survey. During the 2011 surveys, two of these nests were observed to be occupied by red-tailed hawks (*Buteo jamaicensis*) and successfully fledged young. A pair of ravens (*Corvus corax*) successfully fledged young from a nest on a test stand at the Alfa test stand site. An adult barn owl (*Tyto alba*) was observed in a test stand at the Coca test stand site; it is likely that owls use these structures for nesting. In addition, several California towhee nests were observed on the ground in the chaparral and coastal sage scrub areas.

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SECTION 4

Conclusions and Recommendations

4.1 Conclusions

No federal- or state-listed threatened or endangered plant species were identified within the NASA-administered property at SSFL during the 2011 surveys. Santa Susana tarweed, which is listed as rare under the California Native Plant Protection Act, is widespread and abundant throughout much of the site. Two other plants included in the CNPS Rare Plant Inventory—slender mariposa lily and Plummer’s mariposa lily—also were observed on the site.

Two sensitive habitat types are present on the NASA-administered property. These included 1.04 acres of southern willow scrub habitat and 64.44 acres of Venturan coastal sage scrub habitat.

A total of 14 invasive plant species were identified during the 2011 surveys. Five of the identified species are classified by the state as noxious weeds.

Species-specific surveys for special-status animal species were not conducted during the 2011 surveys; however, opportunistic wildlife observations were recorded during both the 2010 and 2011 field surveys. A total of 10 butterfly species, 13 herpetile (reptiles and amphibians) species, 60 bird species, and at least 15 mammal species were identified during the surveys. The least Bell’s vireo was the only federally listed animal species sighted during the 2011 surveys. One individual was sighted during the August 2011 survey. This sighting occurred outside the typical breeding period of this species (April 10 to July 31); therefore, the bird sighted might have been a transient moving through the area.

One potential Quino checkerspot butterfly was observed during the fall 2010 surveys, but no similar looking individuals were observed during the 2011 field surveys.

One California state fully protected species, the ring-tailed cat, was observed during the fall 2010 surveys. This species was not seen during the 2011 field surveys.

Three Species of Special Concern were sighted during the 2011 surveys—coast horned lizard, two-striped garter snake, and loggerhead shrike. Two coast horned lizards and one loggerhead shrike were observed during the fall 2010 surveys.

4.2 Recommendations

Pre-construction surveys by a qualified wildlife biologist are recommended before any proposed demolition, remediation, or other activities involving potential disturbance to wildlife or natural communities are initiated. This approach is especially important if the activities will occur during the breeding season for birds or wildlife. A breeding season schedule will be developed as part of the EIS and used in evaluating potential impacts to listed and protected species.

Because the rock basins and seasonal wetlands are found in areas that are unlikely to be affected by remediation or other onsite activities, protocol-level surveys for special-status invertebrates in these areas are not considered necessary. However, if it is later determined that the basins could be affected, it will be necessary to coordinate with resource agencies to evaluate what additional data might be needed or how mitigation of the impacts should occur.

A delineation of wetlands and waters of the United States and the State of California will be completed during the winter of 2011. These results will be documented in a separate wetland delineation report that will be submitted as in a separate report that will be submitted to the US Army Corps of Engineers for verification.

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SECTION 5

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Appendix A

Special-Status Plants Identified in the Database Review Not Expected to Occur on the Site

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APPENDIX A

Special-status Plants Identified in the Database Review Not Expected to Occur on the Site

APPENDIX A

Special-status Plants Identified in the Database Review Not Expected to Occur on the Site

NASA SSFL 2011 Supplemental Biological Surveys of NASA-Administered Property at Santa Susana Field Laboratory

Scientific Name	Common Name	Status	Blooming Period	Habitat and Notes
<i>Arenaria paludicola</i>	marsh sandwort	FE/CE 1B.1	May-Aug	Sandy openings in marshes and swamps. Only known from two extant occurrences; no herbarium records or California Natural Diversity Data Base (NDDDB) occurrences in Ventura County and the occurrence in Los Angeles County has been extirpated.
<i>Astragalus pycnostachyus</i> var. <i>lanosissimus</i>	Ventura marsh milk-vetch	FE/CE 1B.1	June-Oct	Coastal salt marshes, coastal scrub and coastal dunes. No suitable habitat in the study area.
<i>Astragalus tener</i> var. <i>titi</i>	coastal dunes milk-vetch	FE/CE 1B.1	Mar-May	Coastal scrub, coastal prairie and coastal dunes; vernal mesic areas. No suitable habitat in the study area.
<i>Atriplex coulteri</i>	Coulter's saltbush	1B.2	Mar-Oct	Coastal bluff scrub, coastal dunes and coastal grasslands. No suitable habitat in the study area.
<i>Berberis pinnata</i> ssp. <i>insularis</i>	island barberry	FE/CE 1B.2	Feb-May	Endemic to the Channel Islands. Rocky areas in chaparral, coastal scrub, cismontane woodland, and closed cone coniferous forest.
<i>Camissonia lewisii</i>	Lewis' evening-primrose	3	Mar-June	Coastal dunes, coastal scrub, cismontane woodland, and grassland; generally on sandy or clay soils. No herbarium collections from Ventura County; Los Angeles County collections largely occur in coastal plains and basin areas.
<i>Caulanthus californicus</i>	California jewelflower	FE 1B.1	Feb-May	Chenopod scrub, grassland and pinyon-juniper woodland. No CNDDDB records of this species in Ventura or Los Angeles Counties. Several herbarium collections from 1935 from the Cuyama Valley near the northwestern part of the County, more than 50 miles from the study area.
<i>Chloropyron maritimum</i> ssp. <i>maritimum</i>	salt marsh bird's-beak	FE/CE 1B.2	May-Oct	Coastal salt marshes and dunes. No suitable habitat in the study area.
<i>Dithyrea maritima</i>	beach spectaclepod	CT 1B.1	Mar-May	Coastal dunes and coastal scrub and other sandy habitat near the shore. No suitable habitat in the study area.

APPENDIX A

Special-status Plants Identified in the Database Review Not Expected to Occur on the Site

NASA SSFL 2011 Supplemental Biological Surveys of NASA-Administered Property at Santa Susana Field Laboratory

Scientific Name	Common Name	Status	Blooming Period	Habitat and Notes
<i>Malacothrix squalida</i>	island malacothrix	FE 1B.1	Apr-July	Endemic to the Channel Islands. Coastal bluff scrub, chaparral and cismontane woodland. Endemic to the Channel Islands.
<i>Orcuttia californica</i>	California Orcutt grass	FE/CE 1B.1	Apr-Aug	Vernal pools and playas; typically in heavy clay soils. No suitable habitat in the study area.
<i>Sidalcea neomexicana</i>	Salt Spring checkerbloom	2.2	Mar-June	Alkali playas, brackish marshes, alkali springs also found in mesic alkaline areas in coastal scrub, chaparral, Mojave desert scrub and lower montane coniferous forests. No suitable habitat in study area.

Status Codes

FE = Federally listed endangered species

CE = State-listed endangered species

CT = State-listed threatened species

1B.1 = California Native Plant Society (CNPS) listed as rare, threatened, or endangered in California and elsewhere; considered seriously threatened in California

1B.2 = CNPS listed as rare, threatened, or endangered in California and elsewhere; considered fairly threatened in California

2.2 = CNPS listed as rare, threatened, or endangered in California and elsewhere; but more common elsewhere, considered fairly threatened in California

3 = Plants for which more information is needed; a review list

Sources:

CNDDB Rarefind Version 3.1.0 (CDFG, 2011).

Online CNPS Inventory of Rare and Endangered Plants (8th Edition) (CNPS, 2011)

List of Threatened and Endangered Plants of Ventura County (USFWS, 2011)

Berkeley Consortium of California Herbaria (University of California, 2011)

Appendix B

Rare Plant Reference Site Photographs

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APPENDIX B

Rare Plant Reference Site Photographs



A-1. Reference Site: *Astragalus brauntonii*.
Vegetative; no flowers or buds April 17, 2011.



A-2. Reference Site: *Astragalus brauntonii*.
Flowering June 8, 2011.



A-3. Reference Site: *Dudleya cymosa* spp. *agourensis*
Flowers. June 7, 2011.



A-4. Reference Site: *Dudleya cymosa* spp. *agourensis*
Basal leaves. June 7, 2011.



A-5. Reference Site: *Dudleya cymosa* spp. *marcescens* Flowering. June 7, 2011.



A-6. Reference Site: *Dudleya cymosa* spp. *marcescens*
Basal leaves. June 7, 2011.



A-7. Reference Site: *Dudleya cymosa* spp. *ovatifolia*
Flowering. June 7, 2011.



A-8. Reference Site: *Dudleya cymosa* spp. *ovatifolia*
Flowering. June 7, 2011.

Appendix C

List of Plant Species Observed

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APPENDIX C

List of Plant Species Observed

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List of Plant Species Observed

NASA SSFL2011 Supplemental Biological Surveys of NASA-Administered Property at Santa Susana Field Laboratory

Scientific Name ¹	Common Name ²	Origin ²	Habit ²
BLECHNACEAE			
<i>Woodwardia fimbriata</i>	giant chainfern	N	Herb (P)
DENNSTAEDTIACEAE			
<i>Pteridium aquilinum</i>	Western brackenfern	N	Herb (P)
DRYOPTERIDACEAE			
<i>Dryopteris arguta</i>	coastal woodfern	N	Herb (P)
POLYPODIACEAE			
<i>Polypodium californicum</i>	California polypody	N	Herb (P)
PTERIDACEAE			
<i>Adiantum jordanii</i>	California maidenhair	N	Herb (P)
<i>Aspidotis californica</i>	California lacefern	N	Herb (P)
<i>Pellaea andromedifolia</i>	coffee cliffbrake	N	Herb (P)
<i>Pellaea mucronata</i> var. <i>mucronata</i>	birdfoot cliffbrake	N	Herb (P)
<i>Pentagramma triangularis</i> ssp. <i>triangularis</i>	goldenback fern	N	Herb (P)
SELAGINELLACEAE			
<i>Selaginella bigelovii</i>	bushy spikemoss	N	Herb (P)
PINACEAE			
<i>Pinus muricata</i> ³	Bishop pine	N	Tree
AIZOACEAE			
<i>Mesembryanthemum crystallinum</i> ⁴	common iceplant	I	Herb (A/P)
ADOXACEAE			
<i>Sambucus nigra</i> ssp. <i>caerulea</i> (<i>Sambucus mexicana</i>) ⁵	American black elderberry	N	Shrub/Tree
AMARANTHACEAE			
<i>Amaranthus albus</i>	tumbleweed	I	Herb (A)
<i>Amaranthus blitoides</i>	mat amaranth	I	Herb (A)
ANACARDIACEAE			
<i>Malosma laurina</i>	laurel sumac	N	Shrub
<i>Rhus ovata</i>	sugar sumac	N	Shrub

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NASA SSFL2011 Supplemental Biological Surveys of NASA-Administered Property at Santa Susana Field Laboratory

Scientific Name ¹	Common Name ²	Origin ²	Habit ²
<i>Schinus molle</i>	Peruvian peppertree	I	Tree
<i>Toxicodendron diversilobum</i>	Pacific poison oak	N	Shrub
APIACEAE			
<i>Anthriscus caucalis</i>	bur chervil	I	Herb (A)
<i>Bowlesia incana</i>	hairy bowlesia	N	Herb (A)
<i>Daucus pusillus</i>	American wild carrot	N	Herb (A)
<i>Foeniculum vulgare</i> ⁴	sweet fennel	I	Herb (B/P)
<i>Lomatium lucidum</i>	shiny biscuitroot	N	Herb (P)
<i>Sanicula bipinnata</i> ⁶	poison sanicle	N	Herb (P)
<i>Sanicula crassicaulis</i>	Pacific blacksnakeroot	N	Herb (P)
<i>Torilis arvensis</i>	spreading hedgeparsley	I	Herb (A)
<i>Yabea microcarpa</i>	false carrot	N	Herb (A)
APOCYNACEAE			
<i>Vinca major</i>	bigleaf periwinkle	I	Vine
ARACEAE			
<i>Lemna</i> sp.	duckweed	N	Herb (P)
ASCLEPIADACEAE			
<i>Asclepias eriocarpa</i>	woollypod milkweed	N	Herb (P)
<i>Asclepias fascicularis</i>	Mexican whorled milkweed	N	Herb (P)
ASTERACEAE			
<i>Acourtia microcephala</i>	sacapellote	N	Herb (P/SS)
<i>Agoseris grandiflora</i>	bigflower agoseris	N	Herb (P)
<i>Artemisia californica</i>	coastal sagebrush	N	Shrub
<i>Artemisia douglasiana</i>	Douglas' sagewort	N	Herb (P)
<i>Baccharis pilularis</i>	coyotebrush	N	Shrub
<i>Baccharis salicifolia</i>	mule-fat	N	Shrub
<i>Carduus pycnocephalus</i> ⁴	Italian plumeless thistle	I	Herb (A)
<i>Centaurea melitensis</i> ⁴	Maltese star-thistle	I	Herb (A/B)
<i>Cirsium occidentale</i> var. <i>occidentale</i>	cobwebby thistle	N	Herb (B)
<i>Cirsium vulgare</i> ⁴	bull thistle	I	Herb (B)
<i>Conyza bonariensis</i>	asthmaweed	I	Herb (A/B)

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List of Plant Species Observed

NASA SSFL2011 Supplemental Biological Surveys of NASA-Administered Property at Santa Susana Field Laboratory

Scientific Name ¹	Common Name ²	Origin ²	Habit ²
<i>Conyza canadensis</i>	Canadian horeseweed	N	Herb (A/B)
<i>Corethrogyne filaginifolia</i>	common sandaster	N	Herb (P/SS)
<i>Deinandra fasciculata</i>	clustered tarweed	N	Herb (A)
<i>Deinandra minthornii</i> ⁷	Santa Susanna tarweed	N	Shrub
<i>Encelia californica</i>	California brittlebush	N	SS/Shrub
<i>Ericameria pinifolia</i>	pinebush	N	Shrub
<i>Erigeron foliosus</i>	leafy fleabane	N	Herb (P)
<i>Eriophyllum confertiflorum</i>	golden-yarrow	N	SS/Shrub
<i>Gazania linearis</i> ⁴	treasureflower	I	Herb (P)
<i>Hazardia squarrosa</i> var. <i>grindelioides</i>	sawtooth goldenbush	N	SS/Shrub
<i>Heterotheca grandiflora</i>	telegraphweed	N	Herb (A/P)
<i>Hypochaeris glabra</i>	smooth cat's ear	I	Herb (A)
<i>Lactuca serriola</i>	prickly lettuce	I	Herb (A/B)
<i>Lactuca virosa</i>	bitter lettuce	I	Herb (A/B)
<i>Lasthenia californica</i>	California goldfields	N	Herb (A/P)
<i>Logfia filaginoides</i> (syn. <i>Filago californica</i>)	California cottonrose	N	Herb (A)
<i>Logfia gallica</i> (syn. <i>Filago gallica</i>)	narrowleaf cottonrose	I	Herb (A)
<i>Madia gracilis</i>	grassy tarweed	N	Herb (A)
<i>Malacothrix saxatilis</i>	cliff desertdandelion	N	SS/Shrub
<i>Micropus californicus</i>	q-tips	N	Herb (A)
<i>Microseris douglasii</i>	Douglas' silverpuffs	N	Herb (A)
<i>Pseudognaphalium biolettii</i> (<i>Gnaphalium bicolor</i>) ⁵	two-color rabbit-tobacco	N	Herb/SS (B)
<i>Pseudognaphalium californicum</i>	ladies' tobacco	N	Herb/SS (B)
<i>Pseudognaphalium canescens</i>	Wright's cudweed	N	Herb (A/P)
<i>Pseudognaphalium luteoalbum</i>	Jersey cudweed	I	Herb (A)
<i>Psilocarphus tenellus</i>	slender woollyheads	N	Herb (A)
<i>Rafinesquia californica</i>	California plumeseed	N	Herb (A)
<i>Senecio vulgaris</i>	old-man-in-the-Spring	I	Herb (A/B)
<i>Silybum marianum</i>	blessed milkthistle	I	Herb (A/B)
<i>Sonchus asper</i>	spiny sowthistle	I	Herb (A)
<i>Sonchus oleraceus</i>	common sowthistle	I	Herb (A)

APPENDIX C
LIST OF PLANT SPECIES OBSERVED

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NASA SSFL2011 Supplemental Biological Surveys of NASA-Administered Property at Santa Susana Field Laboratory

Scientific Name ¹	Common Name ²	Origin ²	Habit ²
<i>Stephanomeria virgata</i>	rod wirelettuce	N	Herb (A)
<i>Uropappus lindleyi</i>	Lindley's silverpuffs	N	Herb (A)
<i>Venegasia carpesioides</i>	canyon sunflower	N	SS/Shrub
<i>Xanthium strumarium</i>	rough cocklebur	N	Herb (A)
BORAGINACEAE			
<i>Amsinckia intermedia</i>	common fiddleneck	N	Herb (A)
<i>Amsinckia menziesii</i>	Menzies' fiddleneck	N	Herb (A)
<i>Cryptantha</i> sp. (cf <i>C. barbiger</i>)	cryptantha	N	Herb (A)
<i>Cryptantha muricata</i>	Clokey's cryptantha	N	Herb (A)
<i>Cryptantha micromeres</i>	pygmyflower cryptantha	N	Herb (A)
<i>Emmenanthe penduliflora</i>	whisperingbells	N	Herb (A)
<i>Eriodictyon crassifolium</i>	thickleaf yerba santa	N	Shrub
<i>Eucrypta chrysanthemifolia</i>	spotted hideseed	N	Herb (A)
<i>Pectocarya linearis</i>	sagebrush combseed	N	Herb (A)
<i>Phacelia cicutaria</i>	caterpillar phacelia	N	Herb (A)
<i>Phacelia minor</i>	wild Canterbury bells	N	Herb (A)
<i>Phacelia ramosissima</i>	branching phacelia	N	Herb/SS (P)
<i>Phacelia tanacetifolia</i>	lacy phacelia	N	Herb (A)
<i>Plagiobothrys nothofulvus</i>	rusty popcornflower	N	Herb (A)
BRASSICACEAE			
<i>Arabis sparsiflora</i>	sicklepod rockcress	N	Herb/SS (P)
<i>Brassica nigra</i> ⁴	black mustard	I	Herb (A)
<i>Draba cuneifolia</i>	wedgeleaf draba	N	Herb (A)
<i>Lepidium nitidum</i> var. <i>nitidum</i>	shining pepperweed	N	Herb (A)
<i>Sisymbrium orientale</i>	Indian hedgemustard	I	Herb (A)
<i>Thysanocarpus laciniatus</i>	mountain fringedpod	N	Herb (A)
CACTACEAE			
<i>Opuntia ficus-indica</i> ³	Barbary fig	I	Shrub
CALLITRICHACEAE			
<i>Callitriche marginata</i>	winged water-starwort	N	Herb (A)

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NASA SSFL2011 Supplemental Biological Surveys of NASA-Administered Property at Santa Susana Field Laboratory

Scientific Name ¹	Common Name ²	Origin ²	Habit ²
CAMPANULACEAE			
<i>Triodanis perfoliata</i>	clasping Venus' looking-glass	N	Herb (A)
CAPRIFOLIACEAE			
<i>Lonicera subspicata</i>	southern honeysuckle	N	Shrub/Vine
<i>Symphoricarpos mollis</i>	creeping snowberry	N	SS/Shrub
CARYOPHYLLACEAE			
<i>Cerastium glomeratum</i>	sticky chickweed	I	Herb (A)
<i>Minuartia douglasii</i>	Douglas' stitchwort	H	Herb (A)
<i>Polycarpon tetraphyllum</i>	fourleaf manyseed	I	Herb (A/P)
<i>Silene antirrhina</i>	sleepy silene	N	Herb (A)
<i>Silene gallica</i>	common catchfly	I	Herb (A/B)
<i>Silene laciniata</i>	cardinal catchfly	N	Herb (P)
<i>Stellaria media</i>	common chickweed	N	Herb (A/P)
CHENOPODIACEAE			
<i>Chenopodium californicum</i>	California goosefoot	N	Herb (P)
<i>Dysphania ambrosioides</i>	Mexican tea	I	Herb (A/P)
<i>Salsola tragus</i> ⁴	prickly Russian thistle	I	Herb (A)
CISTACEAE			
<i>Helianthemum scoparium</i>	Bisbee Peak rushrose	N	SS/Shrub
CONVOLVULACEAE			
<i>Calystegia macrostegia</i> ssp. <i>cyclostegia</i>	island false bindweed	N	Herb/Vine
<i>Convolvulus arvensis</i>	field bindweed	I	Herb/Vine
<i>Cuscuta californica</i>	chaparral dodder	N	Herb/Vine
CRASSULACEAE			
<i>Crassula aquatica</i>	water pygmyweed	N	Herb (A)
<i>Crassula connata</i>	sand pygmyweed	N	Herb (A)
<i>Dudleya lanceolata</i>	lanceleaf liveforever	N	Herb (P)
<i>Dudleya pulverulenta</i>	chalk dudleya	N	Herb (P)
CUCURBITACEAE			
<i>Marah macrocarpus</i>	Cucamonga manroot	N	Herb/Vine

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NASA SSFL2011 Supplemental Biological Surveys of NASA-Administered Property at Santa Susana Field Laboratory

Scientific Name ¹	Common Name ²	Origin ²	Habit ²
ERICACEAE			
<i>Arctostaphylos glauca</i>	bigberry manzanita	N	Shrub
EUPHORBIACEAE			
<i>Chamaesyce maculata</i>	spotted sandmat	I ⁸	Herb (A)
<i>Chamaesyce polycarpa</i>	smallseed sandmat	N	Herb (A/P)
<i>Croton setigerus</i>	dove weed	N	Herb (A)
FABACEAE			
<i>Acmispon americanus</i> (syn. <i>Lotus purshianus</i>)	birds-foot trefoil	N	Herb (A)
<i>Acmispon argophyllus</i> (syn. <i>Lotus argophyllus</i>)	silver bird's-foot trefoil	N	Herb/SS (P)
<i>Acmispon glaber</i> (syn. <i>Lotus scoparius</i>)	common deerweed	N	SS (P)
<i>Acmispon strigosus</i> (syn. <i>Lotus strigosus</i>)	strigose bird's-foot trefoil	N	Herb (A)
<i>Lupinus bicolor</i>	miniature lupine	N	Herb (A)
<i>Lupinus hirsutissimus</i>	stinging annual lupine	N	Herb (A)
<i>Lupinus truncatus</i>	collared annual lupine	N	Herb (A)
<i>Medicago polymorpha</i>	burclover	I	Herb (A/P)
<i>Melilotus indicus</i>	annual yellow sweetclover	I	Herb (A)
<i>Trifolium gracilentum</i>	pinpoint clover	N	Herb (A)
<i>Trifolium willdenovii</i>	tomcat clover	N	Herb (A)
<i>Vicia hassei</i>	Hasse's vetch	N	Herb (A)
<i>Vicia villosa</i>	winter vetch	I	Herb (A/P)
FAGACEAE			
<i>Quercus agrifolia</i>	California live oak	N	Tree/Shrub
<i>Quercus berberidifolia</i>	scrub oak	N	Tree/Shrub
GENTIANACEAE			
<i>Zeltnera venusta</i> (syn. <i>Centaurium venustum</i>)	charming centaury	H	Herb (A)
GERANIACEAE			
<i>Erodium botrys</i>	longbeak stork's bill	I	Herb (A/B)
<i>Erodium cicutarium</i>	redstem stork's bill	I	Herb (A/B)
<i>Geranium</i> sp. ³	cultivated geranium	I	Herb (P)

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List of Plant Species Observed

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Scientific Name ¹	Common Name ²	Origin ²	Habit ²
GROSSULARIACEAE			
<i>Ribes malvaceum</i>	chaparral current	N	Shrub
<i>Ribes speciosum</i>	fuchsiaflower gooseberry	N	Shrub
JUGLANDACEAE			
<i>Juglans californica</i>	Southern California walnut	N	Tree/Shrub
LAMIACEAE			
<i>Marrubium vulgare</i>	horehound	I	Herb/SS (P)
<i>Salvia columbariae</i>	chia	N	Herb (A)
<i>Salvia leucophylla</i>	San Luis purple sage	N	SS/Shrub
<i>Salvia mellifera</i>	black sage	N	SS/Shrub
<i>Salvia spathacea</i>	hummingbird sage	N	Herb (P)
<i>Scutellaria tuberosa</i>	Danny's skullcap	N	Herb (P)
<i>Stachys bullata</i>	California hedgenettle	N	Herb (P)
<i>Trichostema lanatum</i>	woolly bluecurls	N	SS/Shrub
<i>Trichostema lanceolatum</i>	vinegarweed	N	Herb (A)
LAURACEAE			
<i>Umbellularia californica</i>	California laurel	N	Tree/Shrub
LYTHRACEAE			
<i>Lythrum hyssopifolia</i>	hyssop loosestrife	I	Herb (A/B)
MALVACEAE			
<i>Malacothamnus fasciculatus</i>	Mendocino bushmallow	N	SS/Shrub
<i>Sidalcea malviflora</i>	dwarf checkerbloom	N	Herb/SS (P)
MONTIACEAE			
<i>Claytonia perfoliata</i>	miner's lettuce	N	Herb (A/P)
MYRSINACEAE			
<i>Anagallis arvensis</i>	scarlet pimpernel	I	Herb (A/B)
NYCTAGINACEAE			
<i>Mirabilis laevis</i> var. <i>crassifolia</i> (syn. <i>Mirabilis californica</i>)	California four o'clock	N	SS (P)
OLEACEAE			
<i>Fraxinus velutina</i> ³	velvet ash	N	Tree

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LIST OF PLANT SPECIES OBSERVEDAPPENDIX C
List of Plant Species Observed***NASA SSFL2011 Supplemental Biological Surveys of NASA-Administered Property at Santa Susana Field Laboratory***

Scientific Name ¹	Common Name ²	Origin ²	Habit ²
ONAGRACEAE			
<i>Camissonia bistorta</i>	southern suncup	N	Herb (A/P)
<i>Camissonia californica</i>	California suncup	N	Herb (A/P)
<i>Camissonia hirtella</i>	Santa Cruz Island suncup	N	Herb (A)
<i>Camissonia micrantha</i>	miniature suncup	N	Herb (A)
<i>Clarkia purpurea</i>	winecup clarkia	N	Herb (A)
<i>Clarkia unguiculata</i>	elegant clarkia	N	Herb (A)
<i>Epilobium</i> sp.	willowherb	N	Herb (A)
PAEONIACEAE			
<i>Paeonia californica</i>	California peony	N	Herb (P)
PAPAVERACEAE			
<i>Dendromecon rigida</i>	tree poppy	N	Shrub/Tree
<i>Eschscholzia californica</i>	California poppy	N	Herb (A/P)
<i>Platystemon californicus</i>	creamcups	N	Herb (A)
PHRYMACEAE			
<i>Mimulus aurantiacus</i>	orange bush monkeyflower	N	Shrub/SS
<i>Mimulus brevipes</i>	widethroat yellow monkeyflower	N	Herb (A)
<i>Mimulus floribundus</i>	manyflowered monkeyflower	N	Herb (A)
<i>Mimulus guttatus</i>	seep monkeyflower	N	Herb (A/P)
<i>Mimulus pilosus</i>	false monkeyflower	H	Herb (A)
PLANTAGINACEAE			
<i>Antirrhinum coulterianum</i>	Coulter's snapdragon	N	Herb (A)
<i>Antirrhinum kelloggii</i>	Kellogg snapdragon	N	Herb (A)
<i>Antirrhinum multiflorum</i>	Sierra snapdragon	N	Herb/SS (A)
<i>Collinsia parryi</i>	Parry's blue eyed Mary	N	Herb (A)
<i>Keckiella cordifolia</i>	heartleaf Keckiella	N	Shrub/SS
<i>Penstemon centranthifolius</i>	scarlet bugler	N	H/SS (P)
<i>Penstemon spectabilis</i>	showy penstemon	N	H/SS (P)
<i>Plantago erecta</i>	dotseed plantain	N	Herb (A)
<i>Veronica peregrina</i>	neckweed	N	Herb (A)

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Scientific Name ¹	Common Name ²	Origin ²	Habit ²
PLATANACEAE			
<i>Platanus racemosa</i>	California sycamore	N	Tree
POLEMONIACEAE			
<i>Allophyllum divaricatum</i>	purple false gilyflower	N	Herb (A)
<i>Allophyllum glutinosum</i>	sticky false gilyflower	N	Herb (A)
<i>Eriastrum sapphirinum</i>	sapphire woollystar	N	Herb (A)
<i>Linanthus californicus</i> (syn. <i>Leptodactylon californicum</i>)	California prickly phlox	N	Herb/SS (P)
<i>Linanthus dianthiflorus</i>	fringed linanthus	N	Herb (A)
<i>Navarretia hamata</i>	hooked pincushionplant	N	Herb (A)
POLYGONACEAE			
<i>Chorizanthe staticoides</i>	Turkish rugging	N	Herb (A)
<i>Eriogonum elongatum</i>	longstem buckwheat	N	SS/Herb (P)
<i>Eriogonum fasciculatum</i> var. <i>fasciculatum</i>	Eastern Mojave buckwheat	N	SS/Shrub
<i>Eriogonum wrightii</i> var. <i>membranaceum</i>	bastardsage	N	SS/Shrub
<i>Persicaria</i> cf <i>hydropiperoides</i> (syn. <i>Polygonum hydropiperoides</i>)	swamp smartweed	N	Herb (P)
<i>Pterostegia drymarioides</i>	woodland pterostegia	N	Herb (A)
<i>Rumex crispus</i>	curly dock	I	Herb (P)
<i>Rumex salicifolius</i>	willow dock	N	Herb (P)
PRIMULACEAE			
<i>Dodecatheon clevelandii</i>	padre's shootingstar	N	Herb (P)
RANUNCULACEAE			
<i>Delphinium cardinale</i>	scarlet larkspur	N	Herb (P)
<i>Delphinium parryi</i>	San Bernardino larkspur	N	Herb (P)
RHAMNACEAE			
<i>Ceanothus crassifolius</i>	hoaryleaf ceanothus	N	Shrub
<i>Ceanothus oliganthus</i>	hairy ceanothus	N	Shrub
<i>Ceanothus spinosus</i>	redheart	N	Shrub
<i>Rhamnus ilicifolia</i>	hollyleaf redberry	N	Shrub

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Scientific Name ¹	Common Name ²	Origin ²	Habit ²
ROSACEAE			
<i>Adenostoma fasciculatum</i>	chamise	N	Shrub
<i>Cercocarpus betuloides</i>	birchleaf mountain mahogany	N	Shrub/Tree
<i>Hertermeles arbutifolia</i>	toyon	N	Shrub
<i>Drymocallis glandulosa</i> (syn. <i>Potentilla glandulosa</i>)	sticky cinquefoil	N	SS/Herb (P)
<i>Prunus dulcis</i> ³	sweet almond	I	Tree
<i>Prunus ilicifolia</i>	hollyleaf cherry	N	Tree/Shrub
<i>Rosa californica</i>	California wildrose	N	Shrub
<i>Rubus ursinus</i>	California blackberry	N	SS (P)
RUBIACEAE			
<i>Galium angustifolium</i>	narrowleaf bedstraw	N	Herb/SS (P)
<i>Galium aparine</i>	stickywilly	N	Herb (A)
<i>Galium cliftonsmithii</i>	Santa Barbara bedstraw	N	Shrub
<i>Galium nuttallii</i>	climbing bedstraw	N	SS/Shrub
<i>Galium parisiense</i>	wall bedstraw	I	Herb (A)
SALICACEAE			
<i>Populus fremontii</i>	Fremont cottonwood	N	Tree
<i>Salix exigua</i>	narrowleaf willow	N	Shrub/Tree
<i>Salix laevigata</i>	red willow	N	Tree
<i>Salix lasiolepis</i>	arroyo willow	N	Tree/Shrub
SAXIFRAGACEAE			
<i>Lithophragma affine</i>	San Francisco woodland-star	N	Herb (P)
SCROPHULARIACEAE			
<i>Scrophularia californica</i>	California figwort	N	Herb (P)
SIMAROUBACEAE			
<i>Ailanthus altissima</i> ⁴	tree of heaven	I	Tree
SOLANACEAE			
<i>Datura wrightii</i>	sacred thorn-apple	N	Herb (A/P)
<i>Nicotiana glauca</i>	tree tobacco	I	Shrub/Tree
<i>Solanum douglasii</i>	greenspot nightshade	N	Herb (P)
<i>Solanum xanti</i>	chaparral nightshade	N	Herb (P)

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Scientific Name ¹	Common Name ²	Origin ²	Habit ²
URTICACEAE			
<i>Hesperocnide tenella</i>	western stingingnettle	N	Herb (A)
<i>Parietaria hespera</i>	rillita pellitory	N	Herb (A/P)
<i>Urtica urens</i>	dwarf nettle	I	Herb (A)
VERBENACEAE			
<i>Verbena lasiostachys</i>	western vervain	N	Herb (P)
AGAVACEAE			
<i>Chlorogalum pomeridianum</i>	wavyleaf soap plant	N	Herb (P)
<i>Yucca gloriosa</i> ³	moundlily yucca	I	Tree/Shrub
<i>Yucca whipplei</i>	chaparral yucca	N	SS/Shrub
ARECACEAE			
<i>Phoenix</i> sp. ³	date palm	I	Tree
<i>Washingtonia robusta</i>	Washington fan palm	I	Tree
CYPERACEAE			
<i>Cyperus eragrostis</i>	tall flatsedge	N	Graminoid (P)
<i>Eleocharis macrostachya</i>	pale spikerush	N	Graminoid (P)
IRIDACEAE			
<i>Sisyrinchium bellum</i>	western blue-eyed grass	N	Herb (P)
JUNCACEAE			
<i>Juncus balticus</i>	mountain rush	N	Graminoid (P)
<i>Juncus bufonius</i>	toad rush	N	Graminoid (A)
<i>Juncus phaeocephalus</i>	brownhead rush	N	Graminoid (P)
<i>Juncus xiphioides</i>	irisleaf rush	N	Graminoid (P)
LILIACEAE			
<i>Calochortus plummerae</i> ⁷	Plummer's mariposa lily	N	Herb (P)
<i>Calochortus clavatus</i> var. <i>gracilis</i> ⁷	slender mariposa lily	N	Herb (P)
MELANTHIACEAE			
<i>Toxicoscordion fremontii</i> (syn. <i>Zigadenus fremontii</i>)	Fremont's deathcamas	N	Herb (P)
POACEAE			
<i>Agrostis pallens</i>	seashore bentgrass	N	Graminoid (P)
<i>Avena barbata</i>	slender oat	I	Graminoid (A)

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Scientific Name ¹	Common Name ²	Origin ²	Habit ²
<i>Avena fatua</i>	wild oat	I	Graminoid (A)
<i>Bromus carinatus</i>	California brome	N	Graminoid (A/P)
<i>Bromus diandrus</i> ⁴	ripgut brome	I	Graminoid (A)
<i>Bromus hordeaceus</i>	soft brome	I	Graminoid (A)
<i>Bromus madritensis</i> ssp. <i>rubens</i> ⁴	red brome	I	Graminoid (A)
<i>Bromus sterilis</i>	poverty brome	I	Graminoid (A)
<i>Chloris virgata</i>	feather fingergrass	I ⁸	Graminoid (A)
<i>Cynodon dactylon</i>	Bermudagrass	I	Graminoid (P)
<i>Elymus glaucus</i>	blue wildrye	N	Graminoid (P)
<i>Gastridium ventricosum</i>	nit grass	I	Graminoid (A)
<i>Hordeum murinum</i> ssp. <i>leporinum</i>	hare barley	I	Graminoid (A)
<i>Lamarckia aurea</i>	goldentop grass	I	Graminoid (A)
<i>Leymus condensatus</i>	giant ryegrass	N	Graminoid (P)
<i>Melica imperfecta</i>	smallflower melicgrass	N	Graminoid (P)
<i>Muhlenbergia microsperma</i>	littleseed muhly	N	Graminoid (A)
<i>Muhlenbergia rigens</i>	deergrass	N	Graminoid (P)
<i>Nassella lepida</i>	foothill needlegrass	N	Graminoid (P)
<i>Nassella pulchra</i>	purple needlegrass	N	Graminoid (P)
<i>Pennisetum setaceum</i> ⁴	crimson fountaingrass	I	Graminoid (P)
<i>Piptatherum miliaceum</i>	smilgrass	I	Graminoid (P)
<i>Poa annua</i>	annual bluegrass	I	Graminoid (A)
<i>Poa pratensis</i>	Kentucky bluegrass	I	Graminoid (P)
<i>Poa secunda</i>	Sandberg bluegrass	N	Graminoid (P)
<i>Polypogon monspeliensis</i>	annual rabbitsfoot grass	I	Graminoid (A)
<i>Schismus arabicus</i>	Arabian schismus	I	Graminoid (A)
<i>Vulpia bromoides</i>	brome fescue	I	Graminoid (A)
<i>Vulpia microstachys</i>	small fescue	N	Graminoid (A)
<i>Vulpia myuros</i> ssp. <i>myuros</i> ⁴	rat-tail fescue	I	Graminoid (A)

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THEMIDACEAE			
<i>Dichelostemma capitatum</i>	bluedicks	N	Herb (P)
TYPHACEAE			
<i>Typha domingensis</i>	southern cattail	N	Herb (P)

Notes:

N = Native

I = Introduced (non-native species that have become naturalized)

(A) = Annual

(B) = Biennial

(P) = Perennial

SS = Sub-Shrub

¹Taxonomy follows the currently accepted nomenclature for plant species occurring in California as indicated on the Jepson On-Line Interchange for California Floristics (University of California, 2011).

²Species common name, origin and grow habitat from the U.S. Department of Agriculture's Plants Database (2011).

³Horticultural or landscape planting

⁴Noxious or invasive weed

⁵Taxonomic or nomenclatural synonym for taxon not occurring in California.

⁶Species was observed just outside of the NASA-administered property by Tarja Sagar.

⁷Special-status plant species

⁸Considered Native in the USDA Plants Databases, but is considered an introduced (naturalized) species in California, per the Jepson On-Line Interchange.

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Appendix D

Representative Photographs of the Site, Special-status Plants, and Wildlife Species

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APPENDIX D

Representative Photographs of the Site, Special-status Plants, and Wildlife Species



B-1 Santa Susana tarplant (*Deinandra minthornii*)—August 18, 2011



B-2 Santa Susana tarplant (*Deinandra minthornii*)—August 18, 2011



B-3 Plummer's mariposa lily (*Calochortus plummerae*)—
June 27, 2011



B-4 Plummer's mariposa lily (*Calochortus plummerae*)—
June 27, 2011



B-5 View northeast of southern willow scrub in Alfa Area—April 2011



**B-6 Woodrat (*Neotoma* sp.) nest—
April 2011**



**B-7 Coast horned lizard (*Phrynosoma blainvillii*),
Area I—April 2011**



**B-8 Two striped garter snake (*Thamnophis hammondi*),
Area 1—April 2011**



B-9 Stick nest in sandstone cliff—April 2011



**B-10 Red-tailed hawk (*Buteo jamaicensis*) nest—
April 2011**



**B-10 Dead canyon bat (*Parastrellus hesperus*),
Area II Alfa Site—August 2011**



**B-11 Western side-blotched lizard (*Uta stansburiana elegans*)—
April 2011**



B-12 Western rattlesnake (*Crotalus oreganus helleri*), on roadway near the SPA Area—June 2011



B-13 California Striped Racer (*Masticophis lateralis lateralis*)—August 2011



B-14 Square-spotted blue (*Euphilotes battoides*)—June 2011



B-15 Lorquin's admiral (*Limenitis lorquini*)—April 2011

Appendix E Wildlife Species Observed in 2010 and 2011

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APPENDIX E

Wildlife Species Observed in 2010 and 2011

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Wildlife Species Observed in 2010 and 2011

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Common Name	Scientific Name	2010	2011
Butterflies			
Quino Checkerspot ^{1,2}	<i>Euphydryas editha quino</i>	X	
Anise Swallowtail	<i>Papilio zelacaon</i>		X
Western Tiger Swallowtail	<i>Papilio rutulus</i>		X
Checkered White	<i>Pontia protodice</i>		X
Cabbage White	<i>Pieris rapae</i>		X
Orange Sulphur	<i>Colius carythene</i>		X
Square-spotted Blue	<i>Euphilotes battoides</i>		X
American Lady	<i>Vanessa virginiensis</i>		X
Lorquin's Admiral	<i>Limenitis lorquini</i>		X
Funereal Duskywing	<i>Erynnis funeralis</i>		X
Northern White-skipper	<i>Heliopetes ericetorum</i>		X
Herpetiles			
Northern Pacific Treefrog	<i>Pseudacris regilla</i>		X
Western Toad	<i>Anaxyrus [Bufo] boreas</i>	X	
Coast Horned Lizard ³	<i>Phrynosoma blainvillii</i>	X	X
Western Fence Lizard	<i>Sceloporus occidentalis</i>	X	X
California Whiptail	<i>Aspidoscelis tigris munda</i>	X	X
Mountain Garter Snake	<i>Thamnophis elegans elegans</i>	X	
Two-striped Garter Snake ³	<i>Thamnophis hammondi</i>		X
Ring-necked Snake	<i>Diadophis punctatus</i>	X	X
California Striped Racer	<i>Coluber [=Masticophis] lateralis lateralis</i>		X
Gopher Snake	<i>Pituophis catenifer</i>		X
Western Rattlesnake	<i>Crotalus oreganus helleri</i>	X	X
Birds			
Mallard	<i>Anas platyrhynchos</i>	X	X
California Quail	<i>Callipepla californica</i>	X	X

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Common Name	Scientific Name	2010	2011
Great Blue Heron	<i>Ardea herodias</i>	X	X
Green Heron	<i>Butorides virescens</i>	X	X
Turkey Vulture	<i>Cathartes aura</i>	X	X
Cooper's Hawk	<i>Accipiter cooperii</i>	X	X
Red-shouldered Hawk	<i>Buteo lineatus</i>	X	X
Red-tailed Hawk	<i>Buteo jamaicensis</i>	X	X
Ferruginous Hawk	<i>Buteo regalis</i>		X
American Kestrel	<i>Falco sparverius</i>	X	X
Rock Pigeon	<i>Columba livia</i>	X	X
Band-tailed Pigeon	<i>Patagioenas fasciata</i>	X	X
Mourning Dove	<i>Zenaida macroura</i>	X	X
Greater Roadrunner	<i>Geococcyx californianus</i>		X
Barn Owl	<i>Tyto alba</i>		X
Great Horned Owl	<i>Bubo virginianus</i>		X
White-throated Swift	<i>Aeronautes saxatalis</i>	X	X
Black-chinned Hummingbird	<i>Archilochus alexandri</i>	X	X
Anna's Hummingbird	<i>Calypte anna</i>	X	X
Rufous/Allen's Hummingbird	<i>Selasphorus rufus/sasin</i>	X	X
Belted Kingfisher	<i>Megaceryle alcyon</i>	X	X
Acorn Woodpecker	<i>Melanerpes formicivorus</i>	X	X
Nuttall's Woodpecker	<i>Picoides nuttallii</i>	X	X
Northern Flicker	<i>Colaptes auratus</i>	X	X
Black Phoebe	<i>Sayornis nigricans</i>	X	X
Say's Phoebe	<i>Sayornis saya</i>	X	X
Western Kingbird	<i>Tyrannus verticalis</i>		X
Loggerhead Shrike ³	<i>Lanius ludovicianus</i>	X	X
Least Bell's Vireo ²	<i>Vireo bellii pusillus</i>		X
Cassin's Vireo	<i>Vireo cassinii</i>	X	X
Western Scrub-Jay	<i>Aphelocoma californica</i>	X	X
American Crow	<i>Corvus brachyrhynchos</i>	X	X
Common Raven	<i>Corvus corax</i>	X	X

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Common Name	Scientific Name	2010	2011
Oak Titmouse	<i>Baeolophus inornatus</i>	X	X
Red-winged Blackbird	<i>Agelaius phoeniceus</i>		X
Bushtit	<i>Psaltiriparus minimus</i>	X	X
White-breasted Nuthatch	<i>Sitta carolinensis</i>	X	X
Pygmy Nuthatch	<i>Sitta pygmaea</i>	X	X
Rock Wren	<i>Salpinctes obsoletus</i>	X	X
Canyon Wren	<i>Catherpes mexicanus</i>	X	X
Bewick's Wren	<i>Thryomanes bewickii</i>	X	X
House Wren	<i>Troglodytes aedon</i>	X	X
Wrentit	<i>Chamaea fasciata</i>	X	X
Northern Mockingbird	<i>Mimus polyglottos</i>	X	X
California Thrasher	<i>Toxostoma redivivum</i>	X	X
Orange-crowned Warbler	<i>Vermivora celata</i>	X	X
Yellow-rumped Warbler	<i>Dendroica coronata</i>	X	X
MacGillivray's Warbler	<i>Oporornis tolmiei</i>	X	X
Wilson's Warbler	<i>Wilsonia pusilla</i>	X	X
Spotted Towhee	<i>Pipilo maculatus</i>	X	X
California Towhee	<i>Melospiza crissalis</i>	X	X
Song Sparrow	<i>Melospiza melodia</i>		X
Rufous-crowned Sparrow	<i>Aimophila ruficeps</i>	X	X
Lark Sparrow	<i>Chondestes grammacus</i>	X	X
Fox Sparrow	<i>Passerella iliaca</i>	X	X
Lincoln's Sparrow	<i>Melospiza lincolnii</i>	X	X
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	X	X
Blue Grosbeak	<i>Passerina caerulea</i>		X
House Finch	<i>Carpodacus mexicanus</i>	X	X
American Goldfinch	<i>Spinus tristis</i>	X	X
Mammals			
Canyon Bat	<i>Parastrellus hesperus</i>		X
Botta's Pocket Gopher	<i>Thomomys bottae</i>		X
Desert Cottontail	<i>Sylvilagus audubonii</i>	X	X

APPENDIX E

Wildlife Species Observed in 2010 and 2011

NASA SSFL 2011 Supplemental Biological Surveys of NASA-Administered Property at Santa Susana Field Laboratory

Common Name	Scientific Name	2010	2011
Woodrat	<i>Neotoma sp.</i>		X
California Ground Squirrel	<i>Spermophilus beecheyi</i>	X	X
Ring-tailed cat ⁴	<i>Bassariscus astutus</i>	X	
Raccoon	<i>Procyon lotor</i>	X	X
Coyote	<i>Canis latrans</i>	X	X
Bobcat	<i>Felis rufus</i>	X	X
Mountain Lion	<i>Felis concolor</i>	X	X
California Mule Deer	<i>Odocoileus hemionus californicus</i>	X	X
Wild Pig	<i>Sus scrofa</i>	X	X
Gray fox	<i>Urocyon cinereoargenteus</i>		X
Vole species	<i>Microtus sp.</i>	X	X
Mouse species	Rodentia		X

Notes:

¹ Tentative species identification² Federally listed endangered species³ California Species of Concern⁴ California Fully Protected Species

End of Appendix E

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APPENDIX F

Quino Checkerspot Butterfly Habitat Survey for NASA-administered Property at Santa Susana Field Laboratory

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**HABITAT ASSESSMENT FOR THE
ENDANGERED QUINO CHECKERSPOT BUTTERFLY
AT THE NASA-ADMINISTERED AREAS I AND II OF THE
SANTA SUSANA FIELD LABORATORY**

Prepared for:
CH2M Hill, Inc.
155 Grand Avenue, Suite 800
Oakland, CA 94612

PO #945273

Prepared by:
Richard A. Arnold, Ph.D.
Entomological Consulting Services, Ltd.
104 Mountain View Court
Pleasant Hill, CA 94523-2188

Final Report:
April 2012

INTRODUCTION

CH2M Hill, Inc. is assisting the National Aeronautics and Space Administration (NASA) in the preparation of a Natural Resources Management Plan for NASA-administered portions of the Santa Susana Field Laboratory (SSFL). The 2,850-acre SSFL property is located in the hills between Simi Valley and Woodland Hills in eastern Ventura County, CA.

One of the sensitive resources that might possibly occur at the SSFL is the federally endangered Quino Checkerspot butterfly (*Euphydryas editha quino*, Lepidoptera: Nymphalidae). Entomological Consulting Services, Ltd. was hired to assist CH2M Hill in the evaluation of existing habitat conditions to support the Quino Checkerspot in two NASA-administered portions of the SSFL; 41.7 acres within Area I and all 409.5 acres of Area II. Several small additional sectors of SSFL that total 43 acres and border Areas I and II were also included in this habitat assessment survey for the endangered butterfly. All surveyed portions of the SSFL for this habitat assessment are illustrated in Figure 1, an aerial photograph of the site, while Figure 2 illustrates the boundaries of the surveyed areas on the Calabasas topographic map (US Geological Survey 7.5' series).

The remainder of this report provides pertinent background information on the Quino Checkerspot butterfly and the habitats that occur at the SSFL property. It also describes our survey methods and the findings from our habitat assessment survey.

BACKGROUND INFORMATION

Conservation Status.

The Quino Checkerspot butterfly, *Euphydryas editha quino* (Behr) 1863, was listed as an endangered species in late 1990's by the US Fish & Wildlife Service (1997). The primary threats that led to its recognition as an endangered species were loss and degradation of its habitats, fragmentation of remaining occupied sites, lack of connectivity between remaining occupied sites, and adverse impacts due to fire management practices.

The butterfly is not recognized as endangered by the State of California. The state's Fish and Game Code specifically excludes insects as a type of animal that can be recognized as endangered under the state's endangered species statute.

A recovery plan was prepared by the US Fish & Wildlife Service (2003). Ten units of critical habitat, including seven in Riverside County and three in San Diego County, have been recognized (US Fish & Wildlife Service 2009).

Distribution.

Historically, the Quino Checkerspot occurred primarily in Los Angeles, Orange, San Bernardino, Riverside and San Diego counties of California. It was also found in the northwestern part of Baja California, Mexico. Today, all of the currently known locations that still support the Quino Checkerspot are in Riverside and San Diego counties (US Fish & Wildlife Service 2003, 2009).

Based on a review of literature, museum collection records, and findings of recent surveys (BUGGY Data Base, 2012; California Natural Diversity Data Base, 2012), I could not find any bona fide records for Ventura County. Nonetheless, due to the SSFL's location near the Ventura-Los Angeles County border, and restricted access at this property for many decades, it is certainly plausible that the butterfly might be found there if suitable habitat conditions were present.

Natural History.

The Quino Checkerspot is usually associated with openings in scrub, coastal sage scrub, chaparral, oak woodland, and grassland plant communities, especially openings that are characterized by native bunch grasses and forbs. The primary oviposition and larval food plant is Dwarf (also sometimes referred to as "Erect") Plantain (*Plantago erecta*, Plantaginaceae). Larvae occasionally have also been observed feeding on Purple Owl's Clover (*Castilleja exserta*, Orabanchaceae), Rigid Bird's Beak (*Cordylanthus rigidus*, Orabanchaceae), White Snapdragon (*Antirrhinum coulterianum*, Plantaginaceae), and Southern Chinese Houses (*Collinsia concolor*, Plantaginaceae) (Pratt and Emmel 2010).

The sequence of life history events for the Quino Checkerspot can be described as follows. The butterfly is univoltine, i.e., it has one generation per year. There are four stages in the butterfly's life cycle: egg, larva (i.e., caterpillar), pupa, and adult. Its adult flight season is typically about six to eight weeks in length, usually starting in early February and terminating in April. Actual starting and ending times can vary by several weeks between years, as well as the length of the flight season. Individual adults live approximately one to two weeks, during which time they must mate and reproduce. Adults obtain energy and nutrients from the nectar of various native, annual wild flowers, including: *Lasthenia*, *Cryptantha*, *Gilia*, and *Linanthus*, but will occasionally utilize flowers of other plants to obtain nectar.

Mate location occurs primarily on hilltops, where both sexes congregate after eclosion (i.e., adult emergence from the pupa). Upon mating, females disperse throughout the hilltops and downslope from the hilltops to lay their eggs. The eggs are generally laid in masses near the base of *Plantago erecta* plants.

Larvae hatch in about 10-14 days and feed for approximately another 2-4 weeks until their food plants senesce or are defoliated. Young larvae, which have limited mobility at this stage, frequently fail to find sufficient edible food plants and starve. Typically, 90% or more of these young larvae starve to death. As its annual food plant senesces, the partially grown larvae enter a physiological dormant period, known as diapause, which is spent under rocks or in cracks and crevices in the soil to survive the dry season when there is no food for the larvae. The dry season diapause ends with the onset of the next rainy season and the germination of *Plantago erecta*. Post-diapause larvae resume feeding at that time. Because the larvae are cold-blooded, their activity is limited to warm days in the winter. Thus, they especially favor open-canopy areas where sunlight can hit the ground to help them warm up and remain active. After periodic feeding for several weeks they complete their development by pupating. The pupal stage generally lasts about 2 weeks before emergence of the adult butterfly.

Habitats at Areas I and II of SSFL.

A variety of habitat types occur within 41.7-acre study site of Area I and the 409.5-acre Area II at SSFL. These were identified and mapped by CH2M Hill, Inc. during the fall of 2010 (NASA 2011). The habitat types and their approximate acreages (NASA 2010) include:

- a) *Baccharis* Scrub (2.6 acres);
- b) Chaparral (172.6 acres);
- c) Coast Live Oak Riparian Forest (9.2 acres);
- d) Coast Live Oak Woodland (13.2 acres);
- e) Freshwater Marsh (0.2 acre);
- f) Mulefat Scrub (2.1 acres);
- g) Non-native Grassland (18.6 acres);
- h) Venturan Coastal Sage Scrub (64.4 acres);
- i) Southern Willow Scrub (1.0 acre);
- j) Undifferentiated Wetland (0.6 acre);
- k) Developed, i.e., buildings, paved roads, parking lots, etc. (58.1 acres);
- l) Open water, i.e., stormwater detention basins (0.4 acre);
- m) Rock Outcrops (84.5 acres); and
- n) Ruderal (16.8 acres).

Figure 3 illustrates the locations of these habitat types within our study areas at the SSFL.

HABITAT ASSESSMENT METHODS

CH2M Hill, Inc. provided several background materials that were reviewed before our first site visit. These items included reports, maps, and aerial photographs of the study areas, as well as GIS shapefiles for the boundaries of the study areas. The GIS shapefiles, depicting the boundaries of our study areas I and II were loaded into two mapping-grade GPS units manufactured by Trimble to guide our field surveys.

Dr. Robert B. Jensen and I initially visited the SSFL on 18 July 2011 to familiarize ourselves with the property and study areas. Although we had originally intended to survey for dried specimens of *Plantago erecta*, we did not see any remnant individuals of this or other larval food plants and decided to postpone our habitat assessment until the spring of 2012 when the food plants would be more apparent.

Our return field visits occurred between March 5 and 7, 2012. We selected these survey dates because local colleagues indicated that *Plantago erecta* was blooming at other locations. Upon our arrival, Randy Dean of CH2M Hill, Inc., took us to a known location at the SSFL property (but outside of our habitat assessment survey area) where *Plantago erecta* had previously been observed (Faulkner 2010). We confirmed the presence of the food plant, which was in full flower. We then returned to Areas I and II to conduct our habitat assessment surveys.

Initially we drove all of the existing roads within or adjacent to both study areas to determine where there was unsuitable habitat and where there was potentially suitable habitat that might support the butterfly and its food plants that required more intensive searches for the food plants. Unsuitable habitat was characterized by developed areas (i.e., buildings and other

facilities), hardscape (i.e., paved roads, parking lots, etc.), heavily disturbed soils, ruderal vegetation, closed-canopy (i.e., lacking openings where food plants might grow) woodlands, riparian, close-canopy chaparral or scrub, and aquatic habitats (i.e., ponds, drainages, etc.). These areas of unsuitable habitat were noted on a set of aerial photographs for Areas I, II, and the extra survey areas after some spot-checking for larval and adult food plants at selected locations to confirm their absence.

We then returned to all portions of Areas I and II that were initially identified as potential habitat for the food plants of the Quino Checkerspot. These included rock outcrops with patches of thin soils, grasslands, and areas of open canopy woodland, scrub, or chaparral. We systematically hiked throughout all such accessible portions of Areas I, II, and the extra survey areas. Due to the steepness of some rock outcrops, for safety reasons we surveyed these areas using binoculars and a spotting scope from various nearby vantage points.

Locations of any observed food plants were mapped with the Trimble GPS units. All positional information was differentially corrected and converted to ArcGIS (version 10) shapefiles.

Photographs of representative habitat conditions were taken at various locations throughout Areas I, II, and the extra survey areas. A Ricoh-GPS camera was utilized to associate each photograph with its location (Figure 4). The identification numbers of the 72 photopoint locations illustrated in Figure 4 match each photo's identification number in Appendix A of this report.

SURVEY RESULTS

Plantago erecta was observed growing at small patches of thin soils situated on north-facing rock outcrops within a localized portion of Area I. These locations are illustrated in Figure 5. Despite our intensive surveys throughout other portions of Areas I and II, as well as the extra survey areas, it was not observed anywhere else. None of the other known larval food plants of the Quino Checkerspot were observed during our habitat assessment survey. The only adult nectar plant observed was *Lasthenia* sp. It grew in association with some of the *Plantago erecta* patches.

The total mapped area of *Plantago erecta* measured 15,747 ft.² (0.36 acre). However, the density of plants growing within these locations was extremely low, typically less than 5% of the total vegetative cover within a patch and often less than 1% of the vegetative cover. Thus the overall biomass of *Plantago erecta* was quite small.

Although we were not conducting a presence-absence survey for any life stages of the Quino Checkerspot butterfly, according to the Carlsbad office of the US Fish & Wildlife Service (http://www.fws.gov/carlsbad/TEspecies/Documents/QuinoDocs/QuinoMonRef/Quino_Ref_Info.htm) the timing of our habitat assessment survey coincided with the period when late instar larvae or adults were being observed at other locations known to support the butterfly. However, no life stages of the Quino Checkerspot were seen during our field surveys.

CONCLUSIONS

Existing habitat conditions for the Quino Checkerspot within study sites at Areas I and II, as well as in the extra study areas of the SSFL are of such poor quality that I would not expect the endangered butterfly to occur there at this time. This conclusion is based on the following factors:

- a) The Quino Checkerspot butterfly is not known to be associated with most of the predominant habitat types that characterize the study areas.
- b) Largely inappropriate conditions characterize those habitat types that occur at SSFL and are known to support food plants of the Quino Checkerspot, primarily due to the lack of open canopies, the prevalence of non-native grasses and forbs in the understory, etc.
- c) Like its relative, the threatened Bay Checkerspot (*Euphydryas editha bayensis*), the Quino Checkerspot has a highly colonial population structure. Populations are generally found where its larval and adult food plants grow in relatively high densities in patches scattered over dozens, if not hundreds of acres. In contrast, within our study area at SSFL, *Plantago erecta* is limited to a total of 0.36 acre, which represents only 0.08% of the entire study area.
- d) Where it does grow, *Plantago erecta* occurs at very low abundance, with densities typically less than 5% of the total herbaceous vegetative cover and often less than 1%.
- e) None of the checkerspot's secondary larval food plants were observed within our study sites.
- f) The only nectar plant observed was *Lasthenia* and it was of very limited abundance, even less than *Plantago erecta*.
- g) Lastly, all observed occurrences of *Plantago erecta* and *Lasthenia* were on rock outcrops, which are not considered suitable habitat for the Quino Checkerspot. The previously cited webpage of the Carlsbad office of the US Fish & Wildlife Service states "there has never been any demonstrated correlation between occupied Quino habitat and rock outcrops, nor have rock outcrops been described in any published Service documents as components or indicators of suitable habitat."

For these reasons, I conclude that the existing habitat conditions within our survey areas at SSFL are unsuitable to support the endangered Quino Checkerspot butterfly and it is extremely unlikely to occur there.

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BUGGY Data Base. 2012. Report of occurrences for the Quino Checkerspot Butterfly. Data Base maintained by Entomological Consulting Services, Ltd. Pleasant Hill, CA.

California Natural Diversity Data Base (CNDDB). 2012. Report of occurrences for the Quino Checkerspot Butterfly. CNDDB, Rarefind version 3.1.0. California Department of Fish and Game. Sacramento, CA.

Faulkner, D. 2010. Site Assessment for Quino Checkerspot Butterfly, Santa Susana Field Laboratory Area IV, Ventura County, California. Letter report dated 15 July 2010 and addressed to Thomas W. Mulroy of SAIC. 3 pp. & map.

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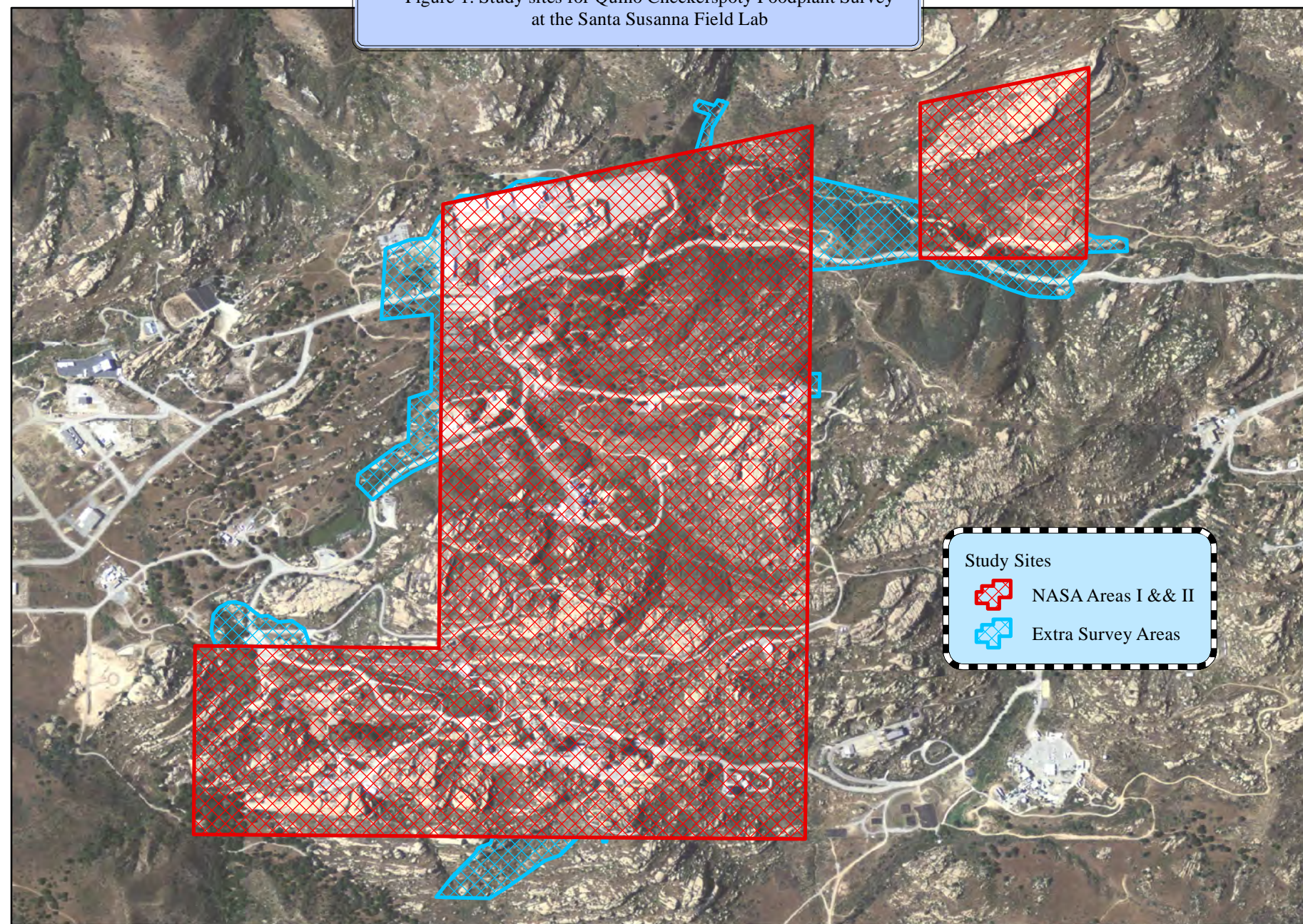
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U.S. Fish & Wildlife Service. 2003. Recovery plan for the Quino Checkerspot Butterfly. Portland, OR. 191 pp.

U.S. Fish & Wildlife Service. 2009. Revised designation of critical habitat for the Quino Checkerspot butterfly (*Euphydryas editha quino*). Federal Register 74:28776-28862.

Figure 1. Study sites for Quino Checkerspot Foodplant Survey at the Santa Susanna Field Lab



0 1,000 2,000 4,000 Feet



March 28, 2012
Entomological Consulting Services, Ltd.

Figure 2. Study sites for Quino Checkerspot Foodplant Survey at the Santa Susanna Field Lab [Calabasas 7.5' Topo]

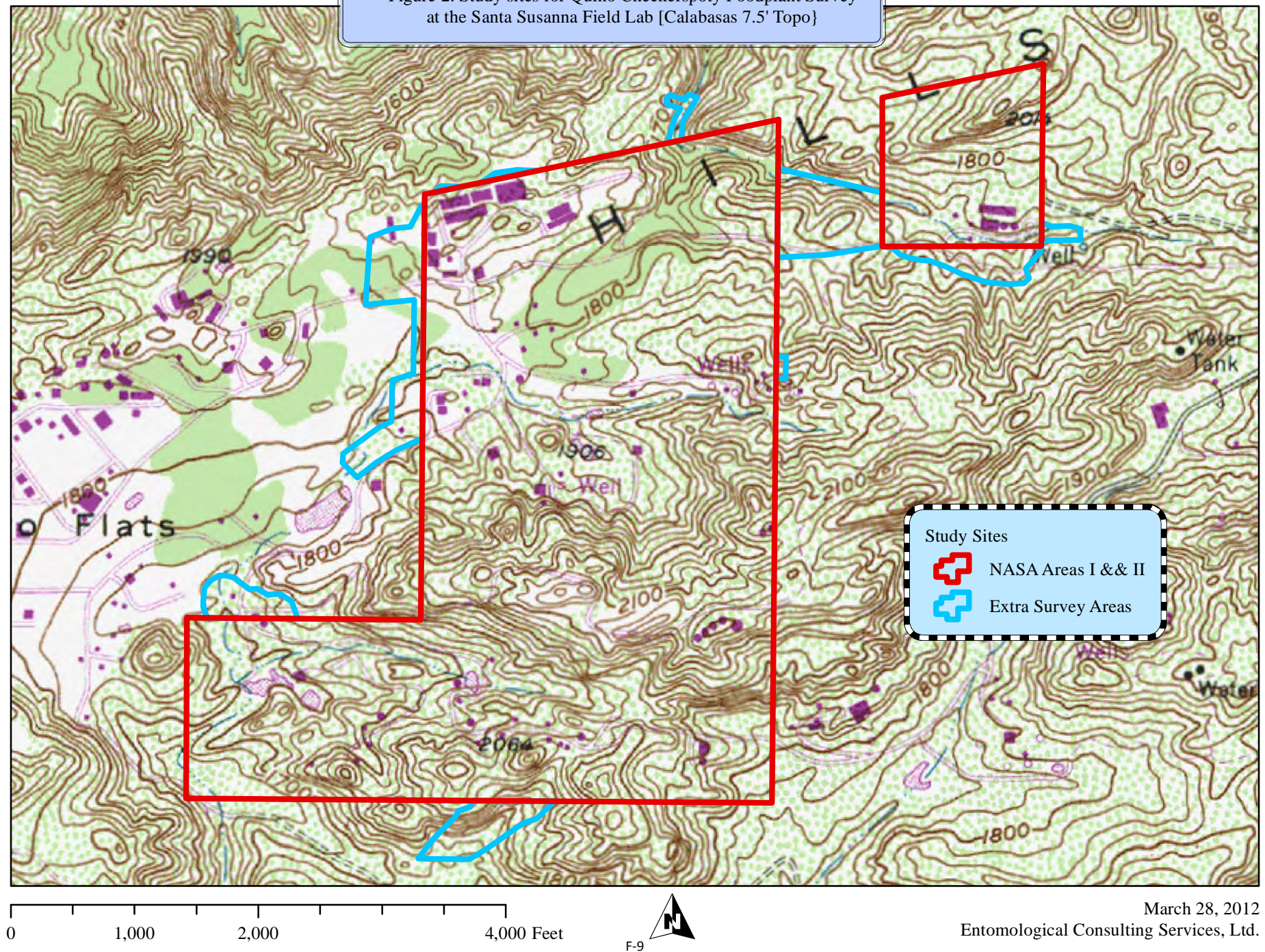


Figure 3. NASA Areas I & II - Santa Susanna Field Lab
Classification of Habitat Types

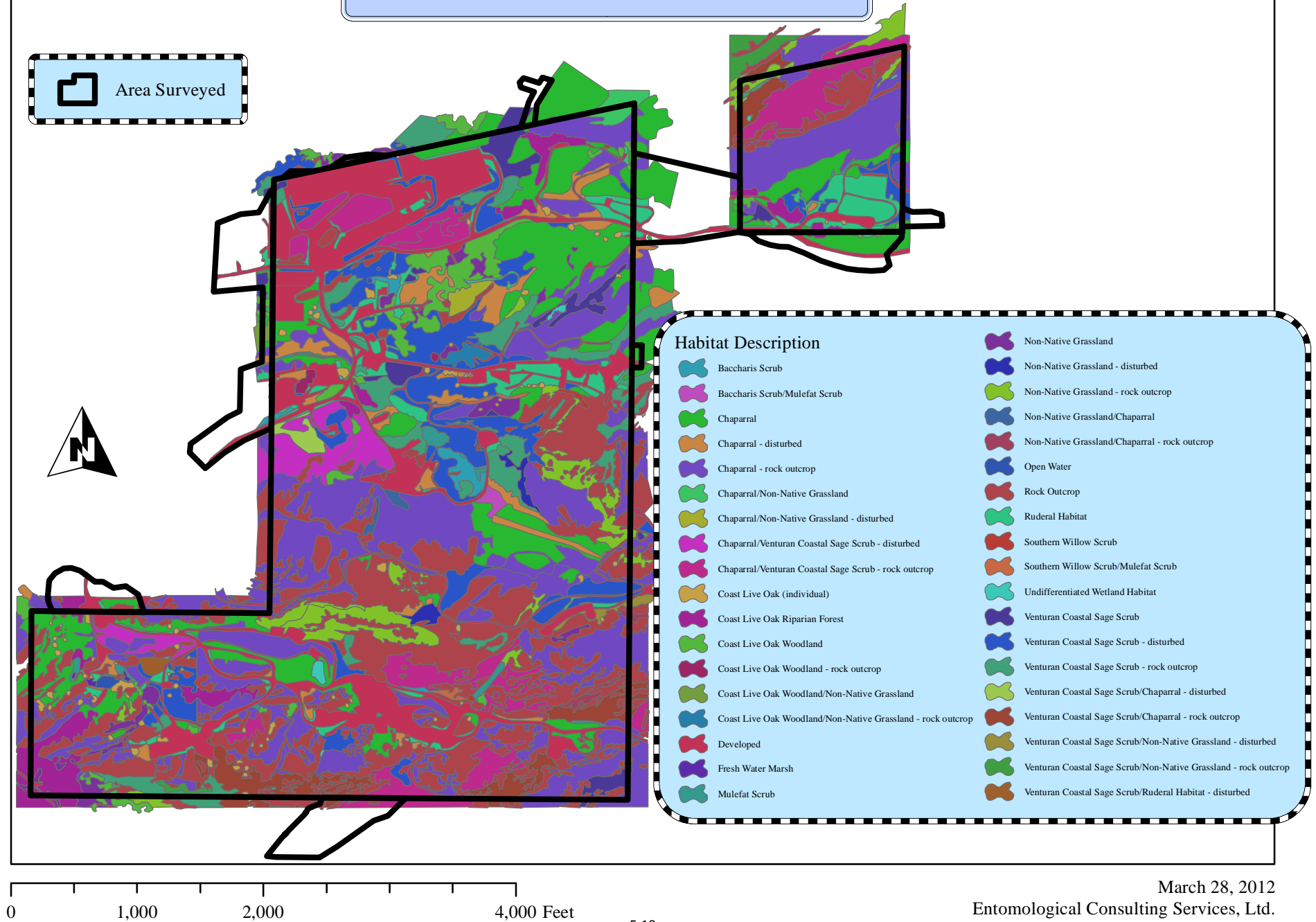
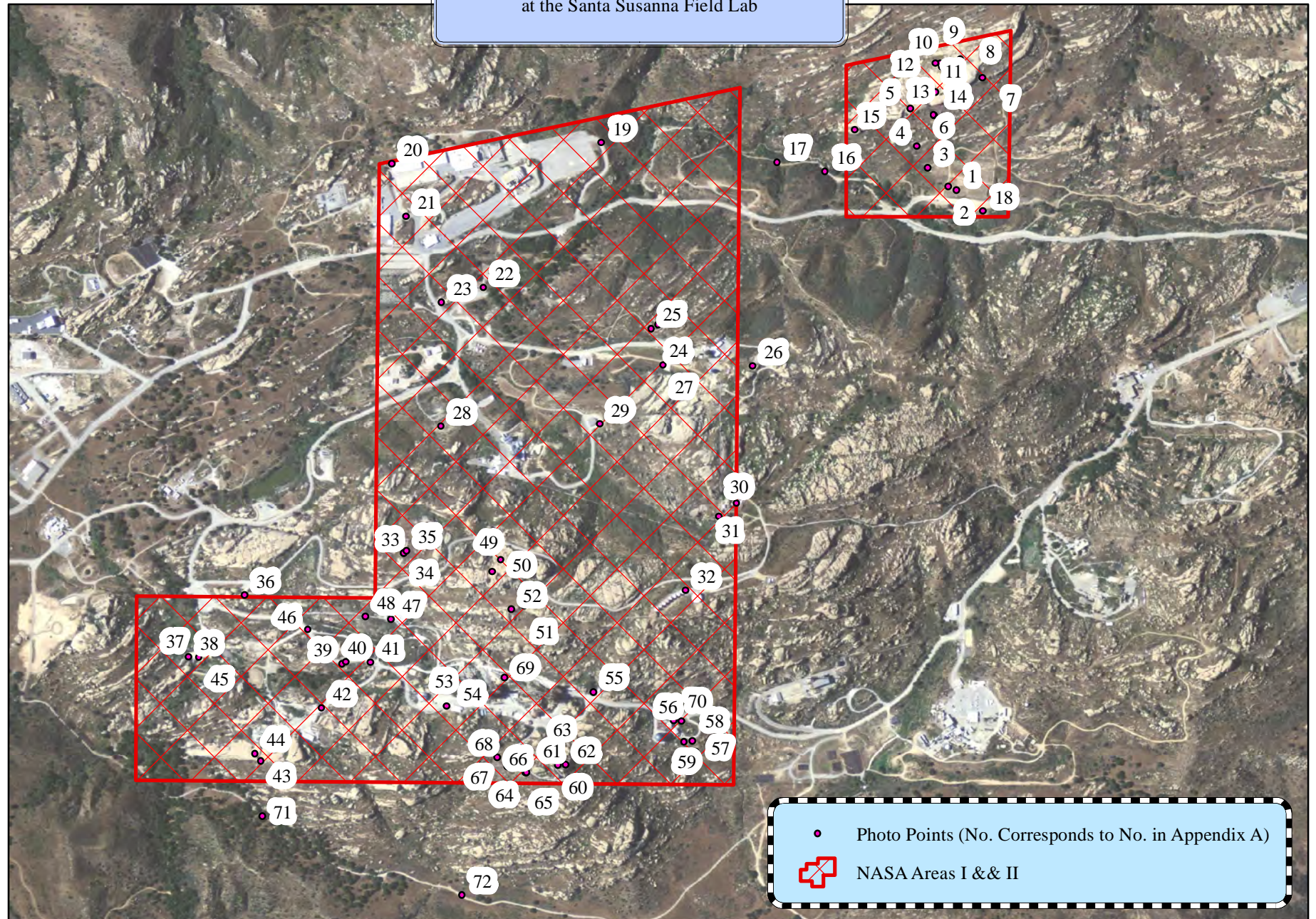


Figure 4. Photography Point Locations
at the Santa Susanna Field Lab

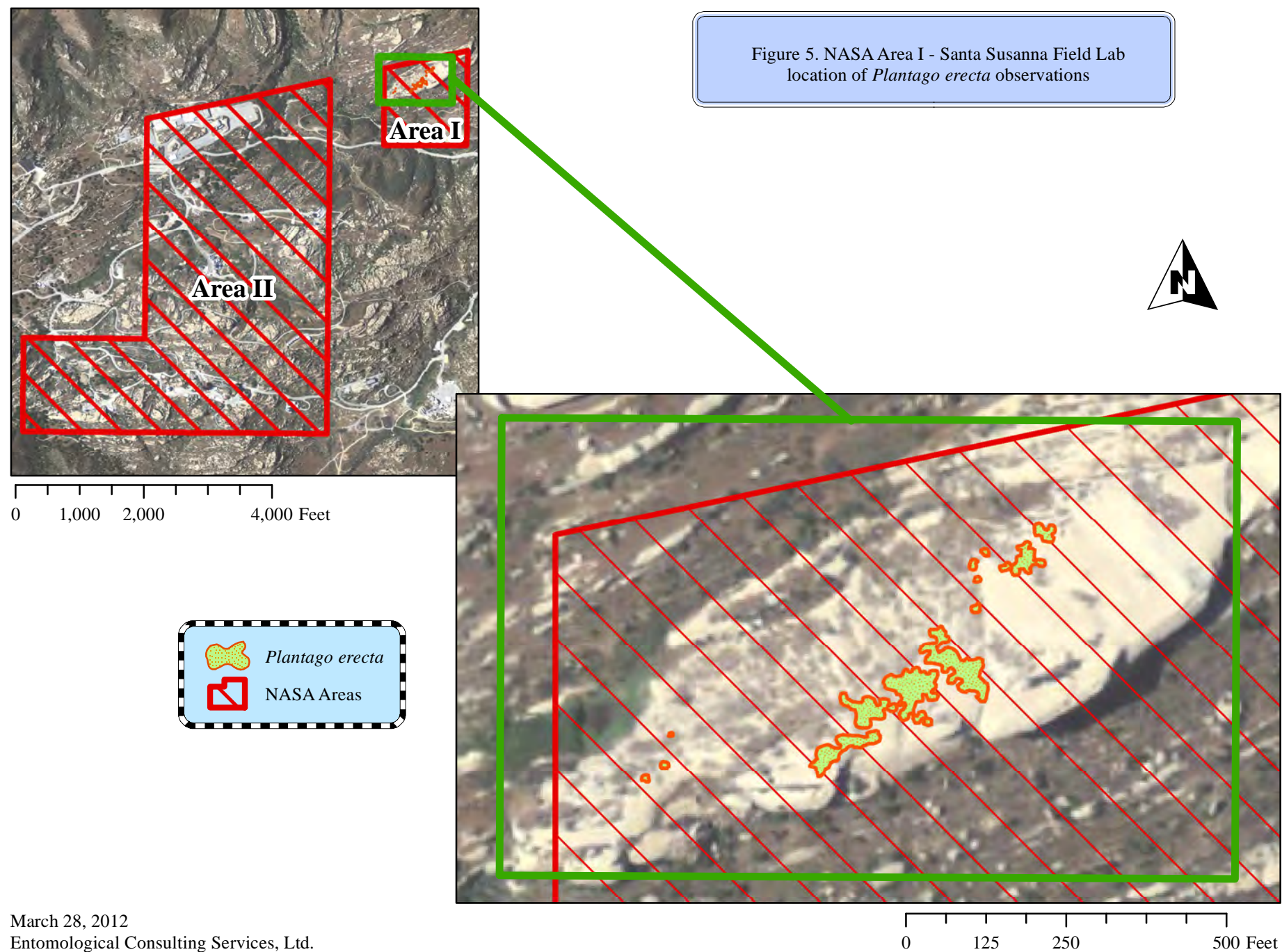


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F-11

March 28, 2012
Entomological Consulting Services, Ltd.



Appendix A

Photodocumentation of

Santa Susanna Field Lab

NASA Areas I & II

Santa Susanna Field Lab



Photo Point 1



Photo Point 2



Photo Point 3



Photo Point 4



Photo Point 5



Photo Point 6



Photo Point 7



Photo Point 8



Photo Point 9

Santa Susanna Field Lab



Photo Point 10



Photo Point 11



Photo Point 12



Photo Point 13



Photo Point 14



Photo Point 15



Photo Point 16



Photo Point 17



Photo Point 18

Santa Susanna Field Lab

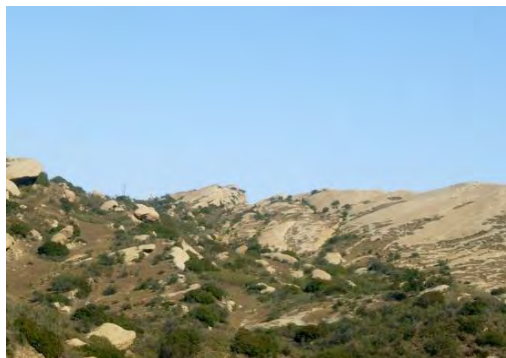


Photo Point 19



Photo Point 20



Photo Point 21



Photo Point 22



Photo Point 23



Photo Point 24

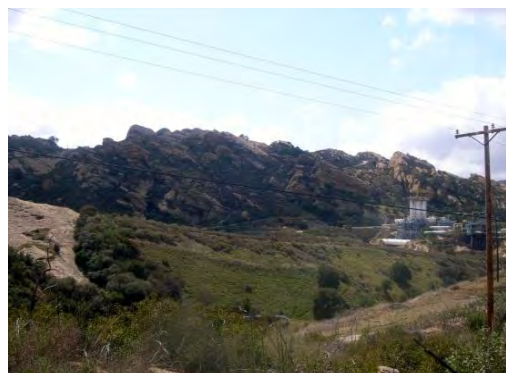


Photo Point 25



Photo Point 26



Photo Point 27

Santa Susanna Field Lab



Photo Point 28



Photo Point 29



Photo Point 30



Photo Point 31



Photo Point 32



Photo Point 33



Photo Point 34

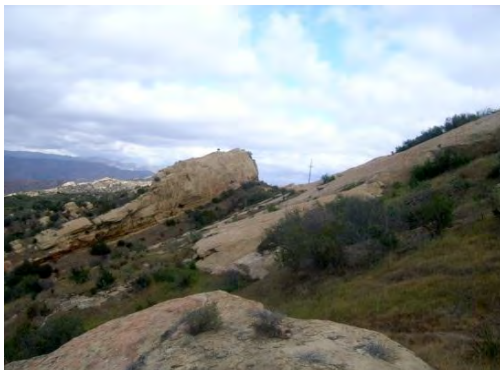


Photo Point 35



Photo Point 36

Santa Susanna Field Lab



Photo Point 37



Photo Point 38



Photo Point 39



Photo Point 40



Photo Point 41



Photo Point 42

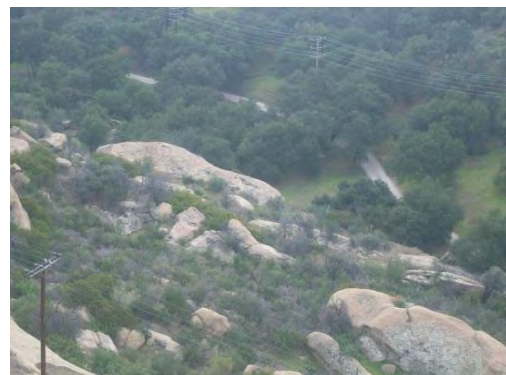


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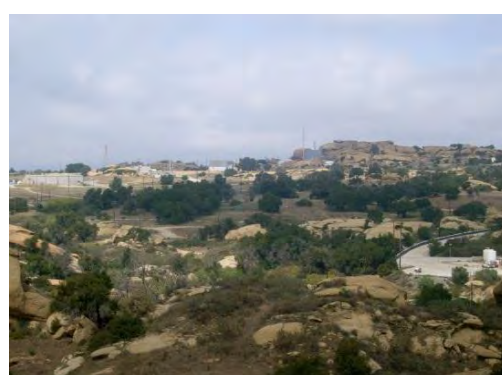


Photo Point 44



Photo Point 45

Santa Susanna Field Lab



Photo Point 46



Photo Point 47



Photo Point 48

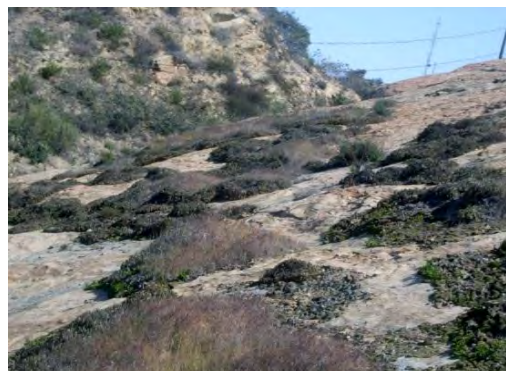


Photo Point 49



Photo Point 50



Photo Point 51



Photo Point 52

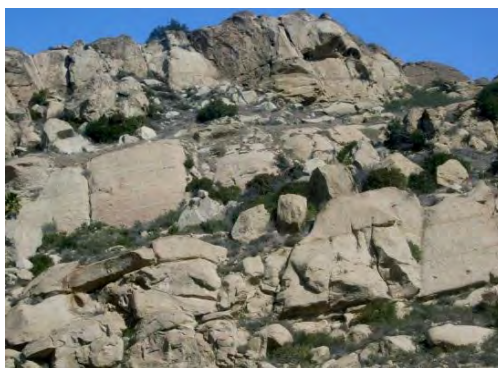


Photo Point 53



Photo Point 54

Santa Susanna Field Lab

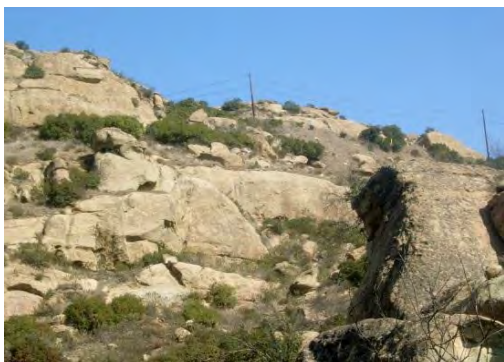


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Photo Point 56

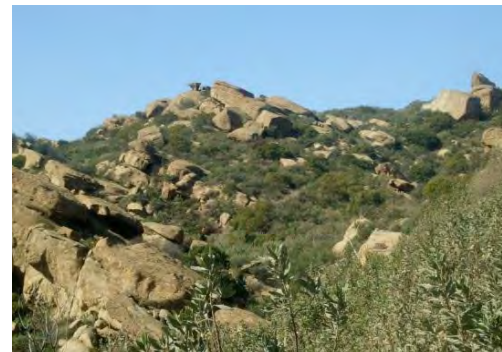


Photo Point 57



Photo Point 58



Photo Point 59



Photo Point 60

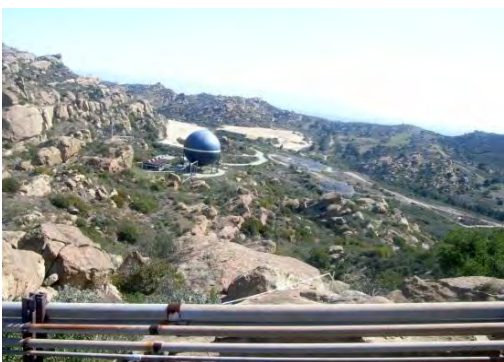


Photo Point 61



Photo Point 62

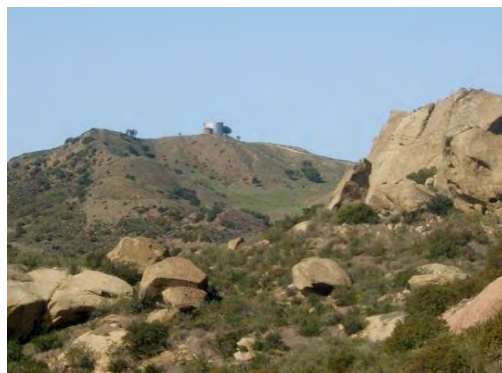


Photo Point 63

Santa Susanna Field Lab



Photo Point 64



Photo Point 65



Photo Point 66



Photo Point 67



Photo Point 68

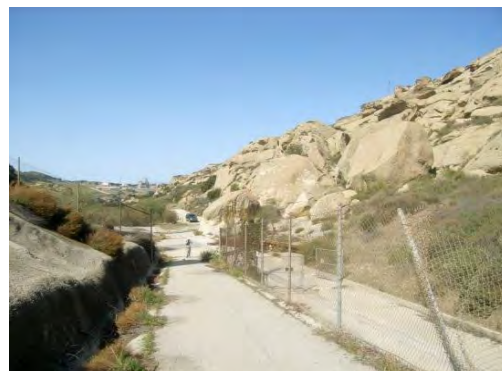


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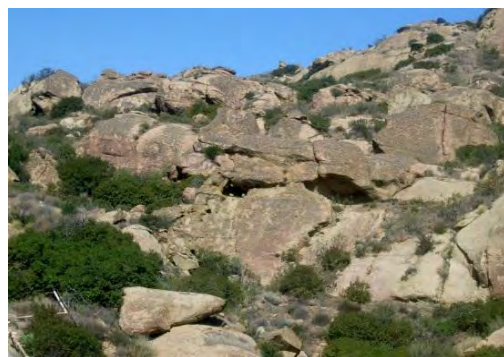


Photo Point 70



Photo Point 71



Photo Point 72

End of Appendix F

APPENDIX G

Wetlands Delineation Report for NASA-administered Property at Santa Susana Field Laboratory

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**G1: Wetlands and Waters of the United States, Delineation for the
NASA-Administered Portions of the
Santa Susana Field Laboratory, Ventura County, California,
March 2012**

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National Aeronautics and Space Administration
George C. Marshall Space Flight Center
Marshall Space Flight Center, AL 35812

April 11, 2012

Reply to Attn of:

Office of Center Operations

U.S. Army Corps of Engineers, Los Angeles District
Regulatory Division, Ventura Field Office
Attn: Antal Szijj
2151 Alessandro Drive, Suite 110
Ventura, California 93001

SUBJECT: Wetlands and Waters of the United States, Request for a Jurisdictional Determination for the NASA-Administered Portions of the Santa Susana Field Laboratory, Ventura County, California.

Dear Mr. Antal Szijj:

The National Aeronautics and Space Administration (NASA) requests a jurisdictional determination for Wetlands and Waters of the United States within the NASA-Administered property of the Santa Susana Field Laboratory located in Ventura County, California.

The NASA-administered property at SSFL consists of 41.7 acres within Area I and all 409.5 acres of Area II.

A wetland delineation was conducted for NASA in January 2012. The survey was conducted to support NASA's preparation of an Environmental Impact Statement (EIS), which is being prepared to assess the potential impacts of NASA's proposed action to demolish structures and remediate soil and groundwater on the NASA-Administered property at SSFL, as well as to support subsequent permitting that might be required under Section 404 of the Clean Water Act. The results of this delineation are considered preliminary pending your determination. A copy of NASA's survey is enclosed.

If you have any questions, please contact Jeremiah Kolb at (256)544-6304.

Sincerely,

A handwritten signature in black ink that reads "Allen Elliott".

Allen Elliott
SSFL Project Director
National Aeronautics and Space Administration (NASA)

Enclosure: Wetlands and Waters of the United States, Delineation for the NASA-Administered Portions of the Santa Susana Field Laboratory, Ventura County, California

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Wetlands and Waters of the United States, Delineation for the NASA-Administered Portions of the Santa Susana Field Laboratory, Ventura County, California

**National Aeronautics and Space Administration
Huntsville, Alabama**

March 2012

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Acronyms and Abbreviations

%	per mil (per thousand)
°F	degrees Fahrenheit
CFR	<i>Code of Federal Regulations</i>
CWA	Clean Water Act
EIS	Environmental Impact Statement
ELV	Expendable Launch Vehicle
HUC	Hydrologic Unit Code
LF	linear foot
LOX	liquid oxygen
NASA	National Aeronautics and Space Administration
NHD	National Hydrology Dataset
NRCS	Natural Resources Conservation Service
NWI	National Wetland Inventory
PABHx	Palustrine Aquatic Bed Permanently Flooded Excavated
PEMC	Palustrine Emergent Seasonally Flooded
PFOA	Palustrine Forested Temporarily Flooded
PLF	Propellant Load Facility
PSSA	Palustrine Scrub-Shrub Temporarily Flooded
PSSB	Palustrine Scrub-Shrub Saturated
PSSC	Palustrine Scrub-Shrub Seasonally Flooded
PUBHx	Palustrine Unconsolidated Bottom Permanently Flooded Excavated
SPA	Storage Propellant Area
SSFL	Santa Susana Field Laboratory
STL	Systems Test Laboratory
U.S.	United States
USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey

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SECTION 1

Introduction

Wetlands and other waters are ecological habitats protected under the federal Clean Water Act (CWA). Activities that have the potential to discharge fill materials into “waters of the United States” (U.S.), including wetlands, must be authorized by the U.S. Army Corps of Engineers (USACE) under Section 404 of the CWA. This report presents the results of a wetlands delineation for the National Aeronautics and Space Administration (NASA)–administered property at the Santa Susana Field Laboratory (SSFL) in Ventura County, California. The results of this delineation are considered preliminary, pending verification by the USACE regulatory branch. A general description of the project location and environmental setting are provided in the following text. Study methods and survey results are provided in Sections 2 and 3, respectively.

1.1 Project Location and Description

SSFL is located mostly within an unincorporated part of Ventura County, California (Figure 1-1). The site is in a remote, mountainous area near the crest of the Simi Hills at the western border of the San Fernando Valley, approximately 30 miles northwest of downtown Los Angeles.

SSFL was established shortly after World War II and has been used primarily as a site to develop and test nuclear reactors, rockets, and missiles. The total site is 2,850 acres and is divided into four test areas (Areas I, II, III, and IV) and two buffer areas (northern and southern buffer areas). The NASA-administered property at SSFL consists of 41.7 acres within Area I and all 409.5 acres of Area II, together representing approximately 15.6 percent of the total area of the site (Figure 1-2).

This report presents the results of a wetland delineation of the NASA-administered property at SSFL. The survey was conducted to support NASA’s preparation of an Environmental Impact Statement (EIS), which is being prepared to assess the potential impacts of NASA’s proposal to demolish structures and remediate soil and groundwater on the NASA-administered property at SSFL, as well as to support subsequent permitting that might be required under Section 404 of the CWA.

1.2 Environmental Setting

SSFL’s landscape is dominated by sandstone outcropping hills, areas of natural vegetation, and numerous industrial facilities and roadways. The site is within the central portion of the Southern California Coast ecological subregion, in the Simi Valley–Santa Susana Mountains (261Be) ecological subsection (Miles and Goudey, 1998). This ecological subsection includes steep mountains, moderately steep to steep hills, and nearly level to gently sloping floodplains, terraces, and alluvial fans.

1.2.1 Terrestrial Vegetation

Eight natural terrestrial habitat types as well as ruderal and developed areas have been identified on the NASA-administered property at SSFL (NASA, 2011). These habitat types are described briefly in the following subsections. Table 1-1 provides a comparison of the mapped habitat types and the current California vegetation classification system (Sawyer et al., 2009). Aquatic features including wetlands and drainages are described in more detail in Section 3.

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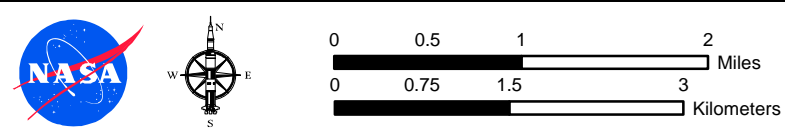
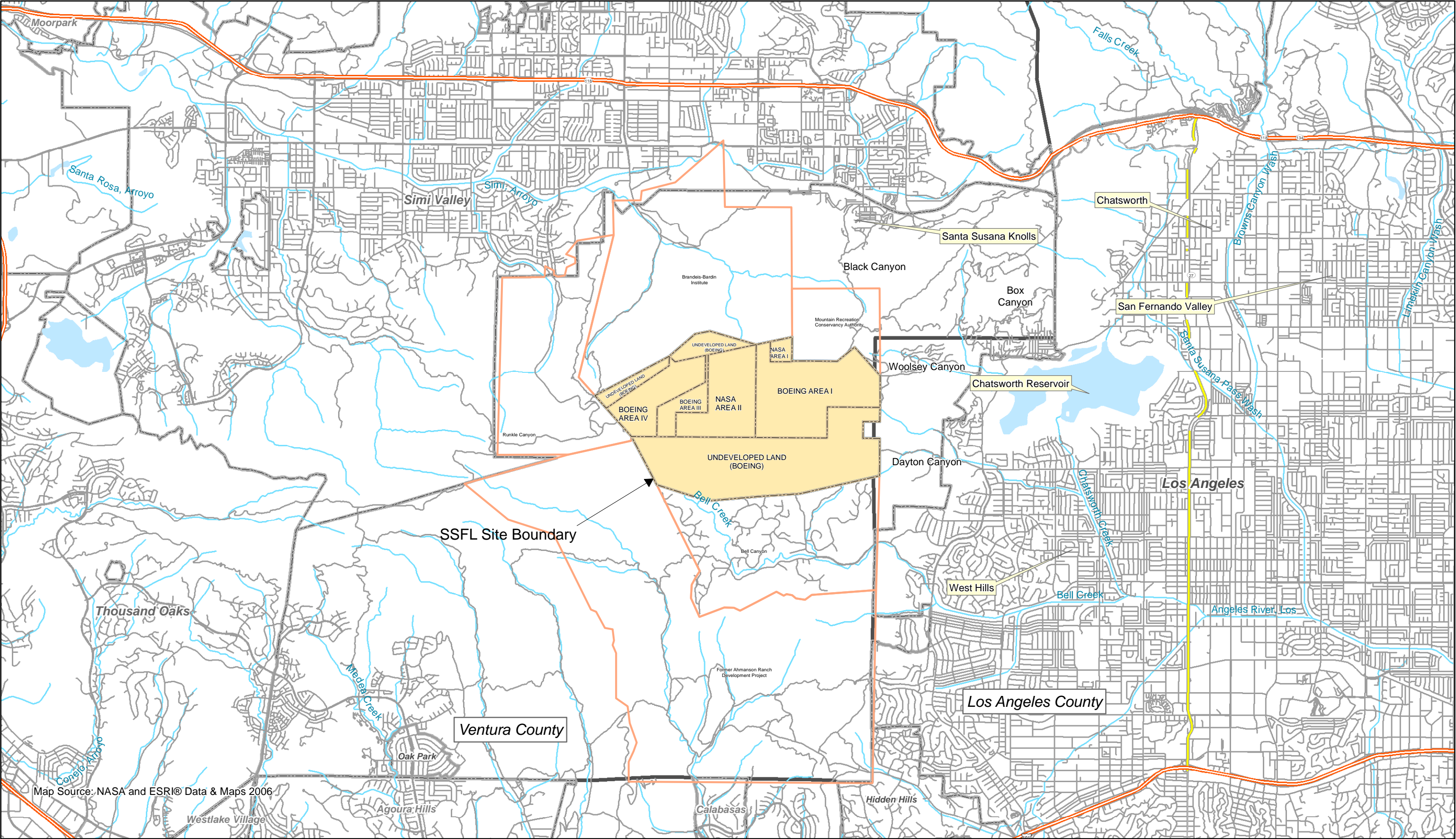
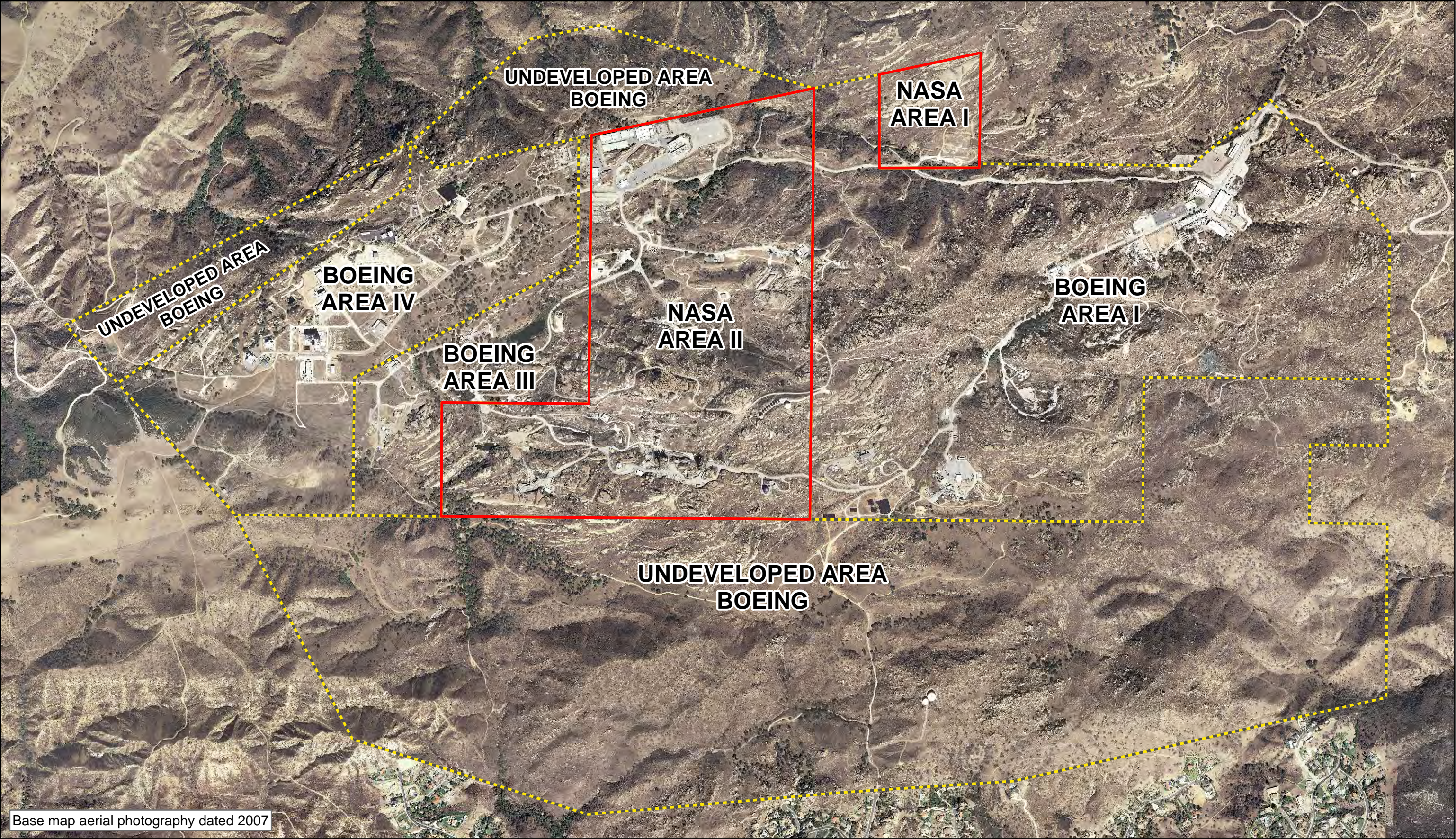
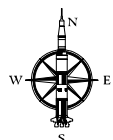


Figure 1-1
Regional Map
NASA Wetlands and Waters of the U.S. Delineation Report
Santa Susana Field Laboratory
Ventura County, California

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Base map aerial photography dated 2007



01-Feb-2012
Drawn By:
A. Cooley

0 750 1,500 3,000 Feet

Legend

- NASA-Administered Property Boundary
- SSFL Administrative Areas

Figure 1-2
Site Overview
NASA Wetlands and Waters of the U.S. Delineation Report
Santa Susana Field Laboratory
Ventura County, California

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TABLE 1-1
Mapped Habitat Types and Current California Vegetation Classification System
Wetland Delineation for the NASA-Administered Portions of SSFL

Mapped Natural Habitat Types	Current California Vegetation Classification System ^a
Chaparral	<i>Adenostoma fasciculatum</i> — <i>Salvia mellifera</i> Shrubland Alliance <i>Malosma laurina</i> Shrubland Alliance <i>Malacothamnus fasciculatus</i> Shrubland Alliance <i>Eriodictyon crassifolium</i> Provisional Shrubland Alliance
Venturan Coastal Sage Scrub	<i>Artemisia californica</i> — <i>Eriogonum fasciculatum</i> Shrubland Alliance
Non-Native Grassland	<i>Avena</i> (<i>barbata</i> , <i>fatua</i>) Semi-Natural Herbaceous Stands
Coast Live Oak Woodland	<i>Quercus agrifolia</i> Woodland Alliance
Coast Live Oak Riparian Forest	<i>Quercus agrifolia</i> Woodland Alliance
Baccharis Scrub	<i>Baccharis pilularis</i> Shrubland Alliance
Mule-fat Scrub	<i>Baccharis salicifolia</i> Shrubland Alliance
Southern Willow Scrub	<i>Salix lasiolepis</i> Shrubland Alliance

^a From Sawyer et al. (2009).

1.2.1.1 Chaparral

Chaparral is the most abundant and widespread natural community at the NASA-administered property. This habitat covers 172.6 acres (approximately 38 percent) of the site.¹ Characteristic species include chamise (*Adenostoma fasciculatum*), hoaryleaf ceanothus (*Ceanothus crassifolius*), black sage (*Salvia mellifera*), laurel sumac (*Malosma laurina*), thicketleaf yerba santa (*Eriodictyon crassifolium*), Mendocino bushmallow (*Malacothamnus fasciculatus*), and chaparral yucca (*Yucca whipplei*). The abundance of these species is variable within this habitat type depending on soils, aspect, past disturbance, and other environmental factors.

1.2.1.2 Venturan Coastal Sage Scrub

Venturan coastal sage scrub covers 64.4 acres (approximately 15 percent) of the site. Characteristic species include coastal sagebrush (*Artemisia californica*), Eastern Mojave buckwheat (*Eriogonum fasciculatum* var. *fasciculatum*), black sage, chaparral yucca, thicketleaf yerba santa, and common deerweed (*Acmispon glaber*).

1.2.1.3 Non-native Grassland

Grassland habitat covers 18.6 acres (approximately 4 percent) of the site and often occurs in a mosaic with other habitat types. Most of the grasslands are characterized by slender oat (*Avena barbata*) intermixed with other introduced annual grasses such as ripgut brome (*Bromus diandrus*), soft brome (*Bromus hordeaceus*), and fescue (*Vulpia* spp). Native grasses including needlegrass (*Nassella* spp.), littleseed muhly (*Muhlenbergia microsperma*), and deergrass (*Muhlenbergia rigens*) are present in a few areas, but generally provide only minimal cover. Common herbaceous species include suncup (*Camissonia* spp.), winecup clarkia (*Clarkia purpurea*), longbeak stork's bill (*Erodium botrys*), and winter vetch (*Vicia villosa*).

1.2.1.4 Coast Live Oak Woodland

Coast live oak woodland is distributed widely across the site but makes up only 13.2 acres (approximately 3 percent) of the NASA-administered property. This habitat is characterized by mature coast live oak (*Quercus agrifolia*) trees. The understory generally consists of annual grasses such as ripgut brome and slender oat, with occasional native grasses including blue wildrye (*Elymus glaucus*) and California brome (*Bromus carinatus*). The

¹ "NASA-administered property" and "site" are synonymous throughout.

understory shrub layer is poorly developed and, where present, generally consists of scattered Pacific poison oak (*Toxicodendron diversilobum*).

1.2.1.5 Coast Live Oak Riparian Forest

Coast live oak riparian forest is found along the edges of the seasonal streams on the site. This habitat type covers 9.2 acres (approximately 2 percent) of the NASA-administered property. The composition of this community is generally similar to the coast live oak woodland habitat described previously, although the understory typically is more diverse in these areas and includes species such as Douglas' sagewort (*Artemisia douglasiana*), creeping snowberry (*Symphoricarpos mollis*), and American black elderberry (*Sambucus nigra*).

1.2.1.6 Baccharis Scrub

Baccharis scrub is limited, covering only 2.6 total acres (less than 1 percent) of the site. This community is characterized by generally pure stands of coyotebrush (*Baccharis pilularis*). In these areas, coyotebrush ranges from dense cover with a sparse herbaceous layer to more open stands with an understory composed of annual grasses and scattered forbs.

1.2.1.7 Mule-fat Scrub

Mule-fat scrub is limited, covering 2.1 acres (less than 1 percent) of the site. This habitat type is characterized by localized, dense stands of mule-fat (*Baccharis salicifolia*).

1.2.1.8 Southern Willow Scrub

Southern willow scrub habitat on the NASA-administered property is characterized by arroyo willow (*Salix lasiolepis*) intermixed with occasional red willow (*Salix laevigata*) and narrowleaf willow (*Salix exigua*). This habitat type is uncommon on the site, covering only 1 acre (less than 1 percent). Southern willow scrub occurs in localized patches around scattered ponds and detention basins and along portions of the seasonal drainages within the site.

1.2.1.9 Sandstone Rock Outcrops

Approximately 85 acres (19 percent) of the NASA-administered property is composed of sandstone outcrops. In many areas the outcrops are devoid of vegetation, while in other areas, the rocks are covered with a diverse assemblage of lichens. In some areas, scattered vascular plants are present. Common plants associated with these rock outcrops include bushy spikemoss (*Selaginella bigelovii*), lanceleaf liveforever (*Dudleya lanceolata*), chalk dudleya (*Dudleya pulverulenta*), cliffbrake (*Pellaea* spp.), orange bush monkey flower (*Mimulus aurantiacus*), and Santa Susana tarweed (*Deinandra minthornii*).

1.2.1.10 Ruderal

Ruderal habitat is common around developed areas and areas that have been subject to human disturbance. Ruderal habitats cover approximately 17 acres (4 percent) of the site. Common species observed in these areas include telegraphweed (*Heterotheca grandiflora*), black mustard (*Brassica nigra*), Maltese star-thistle (*Centaurea melitensis*), silver bird's-foot trefoil (*Acmispon argophyllus*), stork's bill (*Erodium* spp.), and common deerweed.

1.2.1.11 Developed

Developed areas include paved roads, parking areas, buildings, test structures, and other developments. Approximately 58 acres, or 13 percent, of the NASA-administered property have been developed.

1.2.2 Climate and Hydrology

Regional climate data were obtained from the Western Regional Climate Center (2011) and the Natural Resources Conservation Service (NRCS) (2002) for Canoga Park, which is approximately 7 miles southeast of SSFL. Climate data are provided in Appendix A. Average temperatures range from a low of about 39 degrees Fahrenheit (°F) in December and January to a high of 95°F in August. Average annual rainfall is approximately 17 inches. The majority of the precipitation, 87 percent of the total, falls between November and March. The growing season,

defined as having a 50-percent probability of temperatures at or above 32°F, extends from March 6 through November 28, for a total of 267 days (NRCS, 2002).

Precipitation has been measured at SSFL at two onsite monitoring stations since 1960. Precipitation at SSFL is normally in the form of rain, although snow occasionally has fallen during winter months. Precipitation at the site averaged approximately 18.5 inches per year between 1960 and 2008. Annual precipitation has ranged from a low of 6.15 inches in 2007 to a maximum of 41.24 inches in 1998. There was no measurable precipitation in the 2 weeks immediately prior to the wetland delineation field survey, and regional rainfall during December was approximately 40 percent of the average. Overall rainfall in the region between November 1 and December 31, 2011, was approximately 30 percent below the average for this time of year, due largely to slightly above average rainfall during November.

Area I and the northern portion of Area II are located in the 41,142-acre Simi-Valley Hydrologic Sub-Area, which is part of the Calleguas-Conejo Hydrologic Area in the Calleguas Watershed (Hydrologic Unit Code [HUC] 18070103) (CalWater, 2004). Drainage in this area flows north and connects to the drainage in Meier Canyon, which subsequently discharges into Arroyo Simi. Arroyo Semi flows west into Arroyo Las Posas, a tributary to Calleguas Creek, which flows into the Pacific Ocean. Appendix B provides the watershed areas and streams included in the National Hydrology Dataset (NHD) on the NASA-administered property of SSFL.

The southern part of Area II is located in the 184,398-acre Bull Canyon Hydrologic Sub-Area, which is part of the San Fernando Hydrologic Area in the Los Angeles Watershed (HUC 18070105) (CalWater, 2004). Most of the surface water in this area runs off the southern property boundary into the Southwestern Drainage (referred to as Bell Creek on the U.S. Geological Survey [USGS] Calabasas topographic quadrangle map), which subsequently discharges into the Los Angeles River, which flows into the Pacific Ocean (Appendix B).

1.2.3 Soils

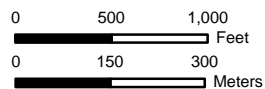
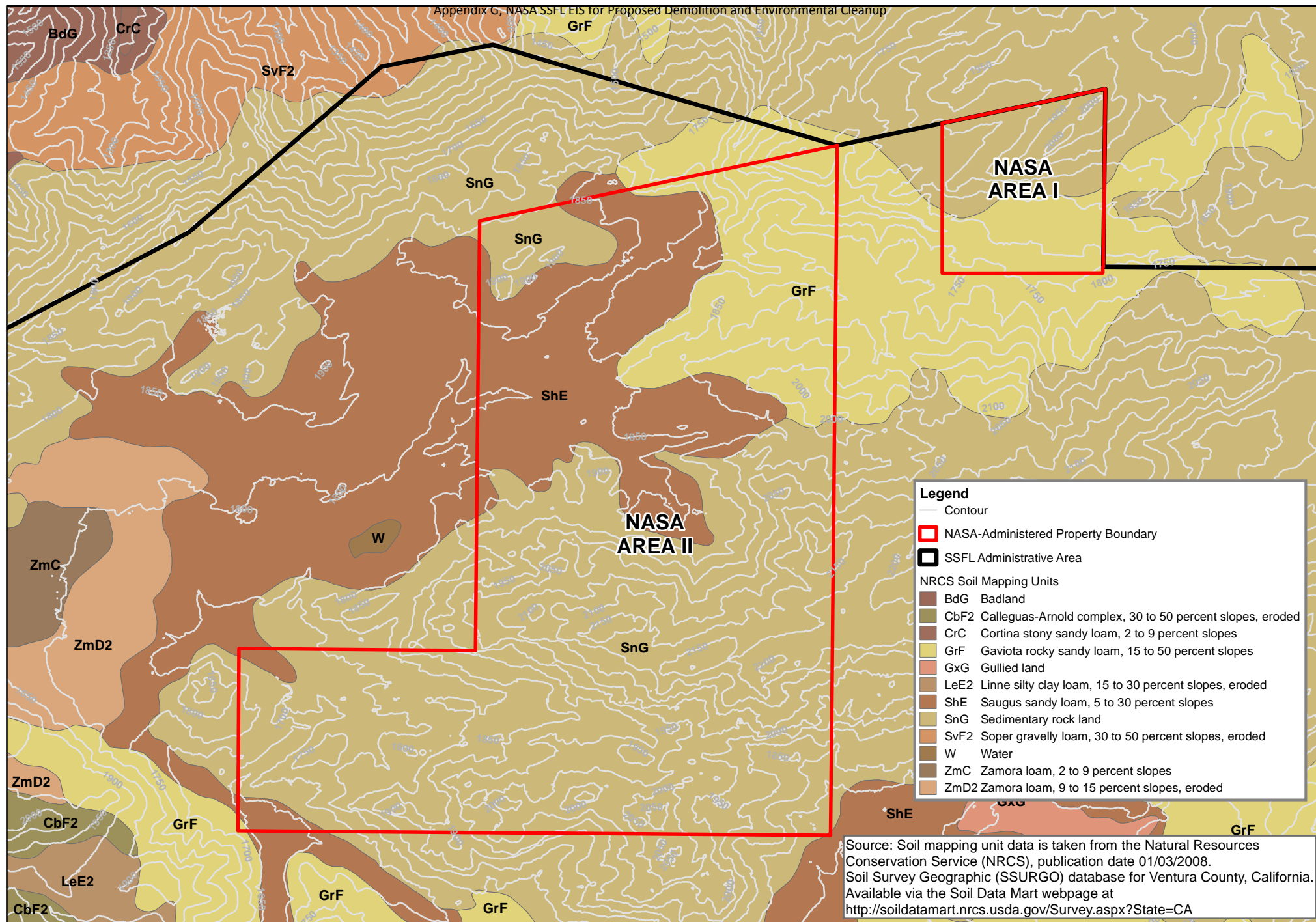
Information about soil types within the wetland study area was obtained from the Soil Survey for Ventura County, Web Soil Survey (NRCS, 2012a) and official NRCS (2012b) soil series descriptions. Three NRCS-mapped soil types occur within the NASA-administered property (NRCS, 2012a). These soil types are described generally in the following text; their distribution on the property is shown in Figure 1-3. The soil colors described in the following sections are all for moist soils. Appendix C contains additional soil information.

GrF—Gaviota rocky sandy loam, 15- to 50-percent slopes. This soil-mapping unit occurs in the southern half of Area I and in the northeastern corner of Area II. These soils formed in material weathered from hard sandstone or meta-sandstone and are found on hills and mountains. These soils have a very shallow or shallow-to-lithic (bedrock) contact. In a typical profile the surface layer to a depth of 10 inches is a brown (7.5 YR 4/4) gravelly loam underlain by hard meta-sandstone. These soils are well to excessively well-drained with very low to very high runoff and moderately rapid permeability.

ShE—Saugus sandy loam, 5- to 30-percent slopes. This soil mapping unit occurs in the northwestern and southwestern portions of Area II. This unit consists of deep, well-drained soils that formed from weakly consolidated sediments found on dissected terraces and foothills. In a typical profile the soil is a dark grayish brown (10YR 4/2) loam in the upper 25 inches with gravel content ranging from 5 to 15 percent (increasing with depth). These soils have medium to rapid runoff and moderate permeability.

SnG—Sedimentary rock land. This soil mapping unit occurs in the northern half of Area I and in the northwestern corner and southern half of Area II. This mapping unit consists mostly of exposed sedimentary rock with very thin, discontinuous areas of soil. There is little available information about this mapping unit; however, the potential for erosion is expected to be relatively low, with rapid runoff and very low permeability.

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Figure 1-3
NRCS Soil Mapping Units
NASA Wetlands and Waters of the U.S. Delineation Report
Santa Susana Field Laboratory
Ventura County, California

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SECTION 2

Methods

A wetland delineation field survey was completed between January 3 and 6, 2012, by CH2M HILL wetland ecologists Russell Huddleston and Steve Long. The purpose of the survey was to identify the limits of wetlands and other waters on the 451.2 acres of NASA-administered property at SSFL (Figure 1-2). The following subsections describe the prefield investigations, field sampling procedures, methods used to delineate and map the wetland boundaries, and wetland classifications.

2.1 Prefield Investigation

Prior to conducting the field work, relevant information pertaining to site conditions was reviewed. The following materials (provided in the appendixes, as indicated) were included in this data review:

- USGS Calabasas quadrangle topographic map and the NHD (Appendix B)
- NRCS-mapped soils and soil series descriptions (Figure 1-3; Appendix C)
- The National Wetland Inventory (NWI) (Appendix D)

2.2 Wetland Delineation

Wetlands are defined as areas that are “inundated by surface water or groundwater with a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas” (Title 40 *Code of Federal Regulations* [CFR], Section 230.3, and Title 33 CFR, Section 238). The survey methodology followed the *Wetland Delineation Manual* (Environmental Laboratory, 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (USACE, 2008).

Wetland determination data points were established at 10 locations, including 5 wetland data points and 5 upland data points (see the figures in Section 3). Sample points were located in areas that were considered to be representative of the wetland boundary being delineated. Appendix E includes the wetland determination data sheets. The following subsections describe the field methods used during the wetland delineation.

2.2.1 Vegetation

At each sample point, plant species were identified and the percent cover was visually estimated and recorded. Herbaceous vegetation was sampled in an approximately 5-foot radius around the sample point. Taxonomic designations follow *The Jepson Manual: Vascular Plants of California* (Baldwin et al., 2012). The *National List of Plant Species that Occur in Wetlands* (Reed, 1988) was used to evaluate the wetland indicator status of each plant species identified. Dominant species included the most abundant species whose cumulative cover accounted for at least 50 percent of the total cover, and any single species that accounted for at least 20 percent of the total vegetative cover. Appendix F provides a list of plant species observed at the sample points and of other common species observed throughout the wetland study area during the field survey.

2.2.2 Soils

Descriptions of soils were made by examining test pits that had been excavated using a tile spade that ranged in depth from 5 to 24 inches. In some areas, the depth of excavation was limited by shallow sandstone contact. At each data point, soil morphological features such as texture, color, and redoximorphic features (if present) were noted. Soil texture was estimated in the field by feel (Thien, 1979), and moist soil colors were determined using

Munsell color charts. In areas where no hydric soil indicators were observed, hydric conditions were assumed to be present where the following conditions existed:

- Dominant vegetation was composed entirely of obligate and facultative wetland plant species.
- There was evidence of seasonal wetland hydrology.
- There was a noticeable difference between the wetland and adjacent upland habitat.

2.2.3 Hydrology

The presence of wetland hydrology was determined based on current as well as previous field observations of saturation and/or inundation, water staining, sediment deposits, and drift deposits. Seasonal rainfall, site drainage, landscape position, and general site topography also were taken into consideration while making wetland hydrology determinations.

2.2.4 Wetland and Water Boundary Mapping

A Trimble Geo-XT global positioning system (GPS) device was used to map the limits of the wetland boundaries. Wetland boundaries were determined in the field based on observations of hydrophytic vegetation, evidence of wetland hydrology, and onsite microtopography. Because most of the soils lacked evidence of hydric indicators, soil characteristics generally were not useful in differentiating the wetland boundaries.

2.3 Delineation of Nonwetland Waters of the United States

Nonwetland waters of the U.S. include such things as rivers, streams, lakes, and ponds. In the absence of adjacent wetlands, the jurisdiction of the USACE extends to the limits of the ordinary high-water mark, which is defined as “the line on the shore established by fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas” (33 CFR 328.3 [e]).

Linear features such as creeks and drainages were delineated by walking the channel bed, to the extent possible, and noting the characteristics of the feature such as substrate, in channel and adjacent vegetation, evidence of flow and hydrologic modifications such as culverts or weirs. To the extent possible, the channel bed was mapped in the field with a Trimble Geo-XT. The ordinary high water was determined and measured at representative cross sections (reference the Section 3 figures) based on observed water staining, drift and debris deposits, sediment deposits, scouring, and other indicators of ordinary high-water flows. Stream data sheets are provided in Appendix F and representative site photographs are provided in Appendix G. In total, 54 stream data sheets were completed within the NASA-administered property. The locations where stream sample points were established corresponded generally to the upper, middle, and lower ends of a particular stream segment (reach), adjusting for other significant features such as tributaries and obstructions (dams or diversions).

Nonlinear features including ponds and impoundments were delineated based on the extent of the ordinary high-water mark as determined by indicators such as water staining and sediment deposits. Emergent wetland vegetation was present in some areas but occurred below the limits of the ordinary high water, and therefore, was not considered to be adjacent. The limits of the ordinary high water were then mapped using a Trimble Geo-XT.

2.4 Classification

Classification of wetlands and other waters identified during the survey follows the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al., 1979). This classification methodology was developed by the U.S. Fish and Wildlife Service as part of the NWI program. The hierarchical classification includes systems, subsystems, and classes to generally categorize the various aquatic habitats. Modifiers are used to denote specific water regimes and/or highly altered areas (excavated or impounded wetlands). Additional details regarding the classification of wetlands identified on the NASA-administered property are provided in Section 3.

SECTION 3

Results

3.1 Survey Conditions

No significant recent disturbance was observed; however, the rainfall between November 1 and December 31, 2011, was approximately 30 percent below average. Therefore, the wetlands and drainages might have been drier than would normally be expected for this time of year. In most areas, the ordinary high-water marks clearly were expressed as water marks and/or drift lines. Additionally, the drainages generally had clearly expressed and well-defined channels. For these reasons, the dry seasonal conditions did not preclude an effective delineation of the wetland boundaries and ordinary high-water marks.

3.2 Wetlands and Waters

As listed in Table 3-1, 1.348 acres of Palustrine wetlands and 1.879 acres of Riverine wetlands were identified within the 451.2-acre NASA-administered property at SSFL. An additional 0.439 acre of other features (such as swales, asphalt drainage ditches, and overflow culverts) were identified in this area, as well. The wetland locations within the study area are shown in Figures 3-1 through 3-6. Descriptions of the wetlands and other features are provided in the following subsections.

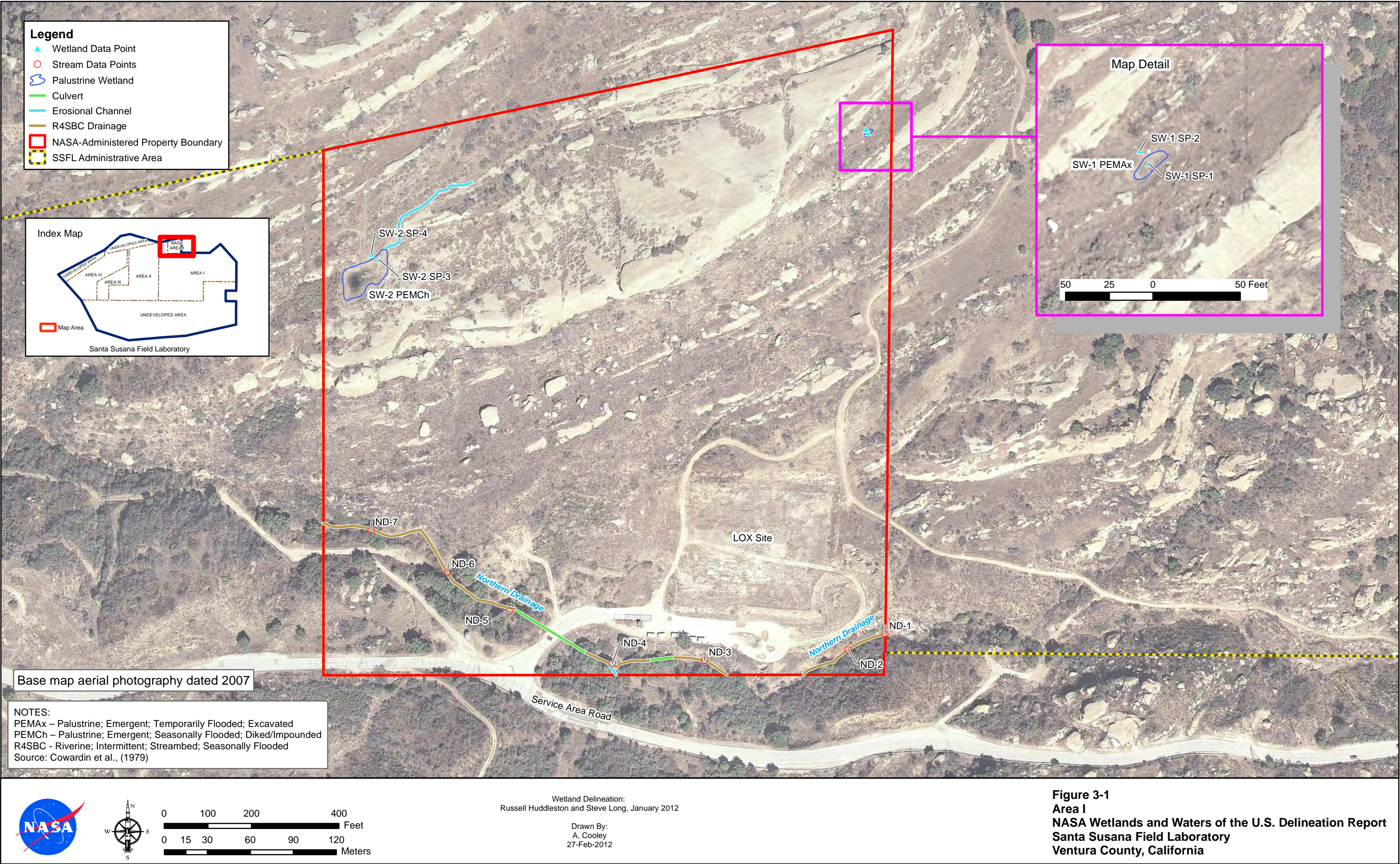
3.2.1 Palustrine Wetlands

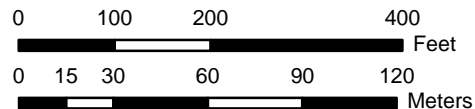
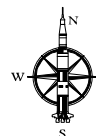
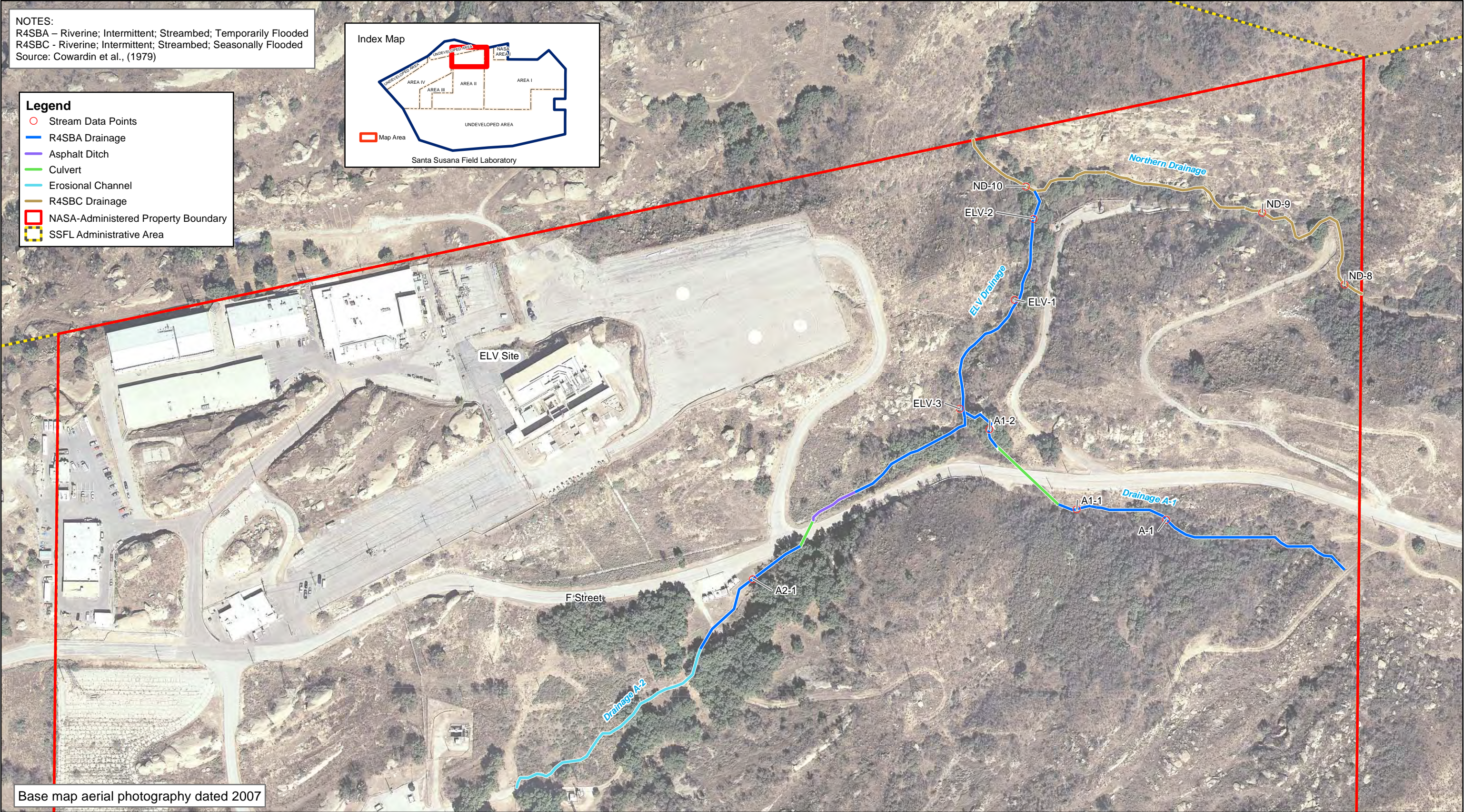
Wetlands classified as part of the Palustrine (P) system are nontidal, freshwater wetlands that might be vegetated with trees, shrubs, herbaceous vegetation or mosses, and lichens. Also included are wetlands lacking such vegetation but with all of the following four characteristics: 1) the total area is less than 20 acres; 2) there are no active wave-formed or bedrock shoreline features; 3) water depth in the deepest part of basin is less than 6 feet at low water; and 4) salinity due to ocean-derived salts is less than 0.5 per mil"/per thousand (‰) (Cowardin et al., 1979). Palustrine wetlands identified on the NASA-administered property fall into two classes: Emergent and Unconsolidated Bottom. The Emergent Class includes wetlands that are characterized by more than 30-percent cover of erect, rooted, herbaceous plants adapted to grow under flooded and/or saturated conditions. The Unconsolidated Bottom Class includes wetlands that are characterized by cobble-gravel, sand, or mud substrates and have less than 30-percent vegetative cover. Water regimes of the Palustrine wetlands identified in the survey area include permanently flooded, seasonally flooded, and temporarily flooded. Descriptions of the Palustrine wetlands are provided in the following subsections.

3.2.1.1 Area I SW-1 (PEMAx)

In the northeastern corner of Area I there is a small (150 square foot) depressional basin that appears to have been excavated. Vegetation observed in the basin during the January 2012 survey included scattered annual plant seedlings of scarlet pimpernel (*Anagallis arvensis*), smooth cat's ear (*Hypochaeris glabra*), longbeak stork's bill, and black mustard. During the April 2011 botanical surveys, aquatic vegetation observed in this area included water pygmyweed (*Crassula aquatica*), slender woollyheads (*Psilocarphus tenellus*), toad rush (*Juncus bufonius*), and hyssop loosestrife (*Lythrum hyssopifolia*). At the edge of the basin, the surface soil is a brown (10 YR 5/3) sandy loam to a depth of 1 inch, underlain by a mixture of light yellowish-brown (10 YR 6/4) sand and brown (10 YR 4/3) fine sandy loam to a depth of 10 inches. Sandstone rock was encountered at a depth of 10 inches. The small basin was dry at the time of the January 2012 survey, but seasonal precipitation was below the average for the time of year. No definitive evidence of wetland hydrology or hydric soils was observed in this area; however, there is a notable change in the vegetation relative to the surrounding areas, a shallow topographic basin with what appears to be sandstone bedrock at a depth of 10 inches, and past observations of wetland vegetation. Taken together, these characteristics suggest that temporary seasonal ponding is likely to occur under more typical seasonal rainfall conditions.

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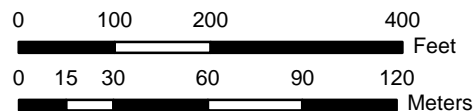
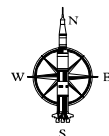




Wetland Delineation:
Russell Huddleston and Steve Long, January 2012

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A. Cooley
05-Mar-2012

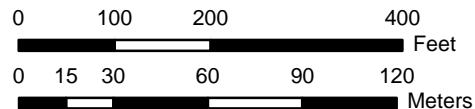
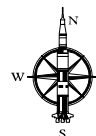
Figure 3-2
Area II North
NASA Wetlands and Waters of the U.S. Delineation Report
Santa Susana Field Laboratory
Ventura County, California



Wetland Delineation:
Russell Huddleston and Steve Long, January 2012

Drawn By:
A. Cooley
01-Mar-2012

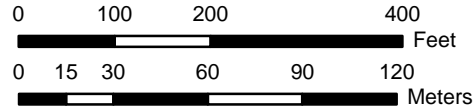
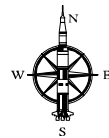
Figure 3-3
Area II - Central North
NASA Wetlands and Waters of the U.S. Delineation Report
Santa Susana Field Laboratory
Ventura County, California



Wetland Delineation:
Russell Huddleston and Steve Long, January 2012

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A. Cooley
27-Feb-2012

Figure 3-4
Area II - Central South
NASA Wetlands and Waters of the U.S. Delineation Report
Santa Susana Field Laboratory
Ventura County, California



Wetland Delineation:
Russell Huddleston and Steve Long, January 2012

Drawn By:
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Figure 3-5
Area II - Southeast
NASA Wetlands and Waters of the U.S. Delineation Report
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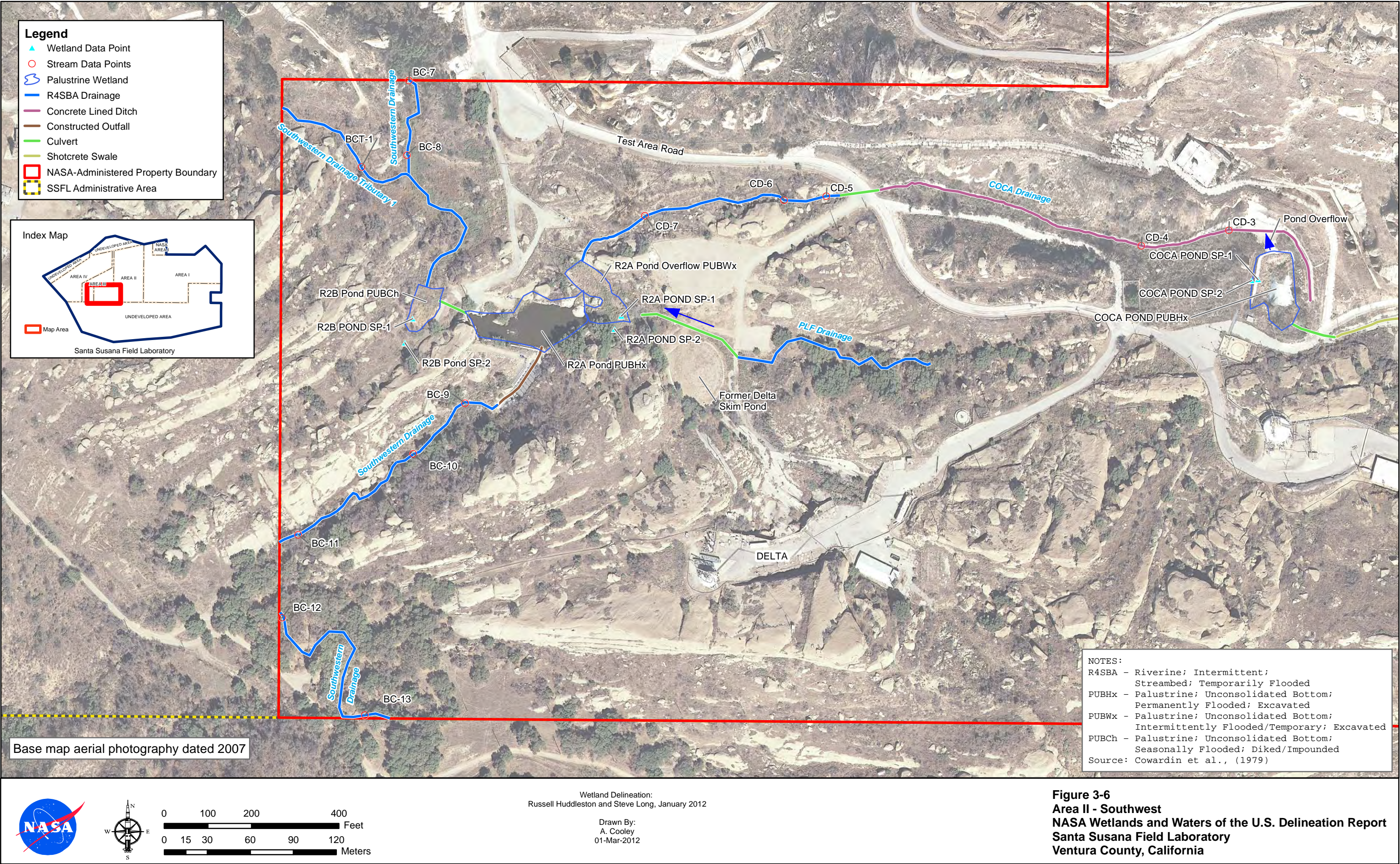


TABLE 3-1
Summary of Wetland Features
Wetland Delineation for the NASA-Administered Portions of SSFL

Feature ID	Acreage
<i>Palustrine Wetlands</i>	
SW-1 (PEMAx)	0.003
SW-1 (PEMCh)	0.152
R2A Pond (PUBHx)	0.511
R2A Pond Overflow (PUBWx)	0.226
R2B Pond (PEMCh)	0.129
Coca Pond (PUBHx)	0.327
<i>Total Palustrine Wetlands</i>	<i>1.348</i>
<i>Riverine Wetlands</i>	
Northern Drainage (R4SBC)	0.488 (3,193 LF)
<i>Northern Drainage Natural Channel</i>	<i>0.465 (2,176 LF)</i>
<i>Northern Drainage Culverts</i>	<i>0.023 (1,017 LF)</i>
ELV Drainage (R4SBA)	0.146 (976 LF)
<i>ELV Natural Channel</i>	<i>0.138 (862 LF)</i>
Asphalt Drainage Ditch	0.008 (114 LF)
Southwestern Drainage (R4SBA)	0.586 (8,826 LF)
<i>Southwestern Drainage Nature Drainage</i>	<i>0.394 (8,049 LF)</i>
<i>Southwestern Drainage Concrete Ditch</i>	<i>0.100 (542 LF)</i>
<i>Southwestern Drainage Culvert</i>	<i>0.004 (65 LF)</i>
<i>Southwestern Drainage Constructed Outfall</i>	<i>0.088 (170 LF)</i>
Southwestern Drainage Tributary (R4SBA)	0.034 (371 LF)
Coca Drainage (R4SBA)	0.479 (1,899 LF)
<i>Coca Drainage Natural Channel</i>	<i>0.203 (655 LF)</i>
<i>Coca Drainage Concrete Ditch</i>	<i>0.265 (1,155 LF)</i>
<i>Coca Drainage Culverts</i>	<i>0.011 (89 LF)</i>
PLF Drainage (R4SBA)	0.040 (758 LF)
<i>PLF Drainage Natural Channel</i>	<i>0.029 (511 LF)</i>
<i>PLF Drainage Culverts</i>	<i>0.011 (247 LF)</i>
Drainage A-1 (R4SBA)	0.060 (911 LF)
<i>Drainage A-1 Natural Channel</i>	<i>0.050 (724 LF)</i>
<i>Drainage A-1—Culvert</i>	<i>0.010 (187 LF)</i>
Drainage A-2 (R4SBA)	0.046 (935 LF)
<i>Drainage A-2 Natural Channel</i>	<i>0.030 (324 LF)</i>
<i>Drainage A-2 Erosional Feature</i>	<i>0.013 (547 LF)</i>
<i>Drainage A-2 Culvert</i>	<i>0.003 (64 LF)</i>
<i>Total Riverine Wetlands</i>	<i>1.879 (17,869)</i>

TABLE 3-1

Summary of Wetland Features***Wetland Delineation for the NASA-Administered Portions of SSFL***

Feature ID	Acreage
<i>Other Features</i>	
Southwestern Drainage Swale (Alpha)	0.157 (6,860 LF)
Southwestern Drainage Swale Culverts	0.013 (218 LF)
Southwestern Drainage Swale Overflow Culvert	0.024 (344 LF)
Coca—Shotcrete Swale	0.236 (1,027 LF)
Coca—Shotcrete Swale Culverts	0.009 (68 LF)
<i>Total Other Features</i>	<i>0.439 (8,517 LF)</i>

Notes:

ELV = Expendable Launch Vehicle

LF = linear foot

PLF = Propellant Load Facility

Surrounding vegetation is characterized by scattered coastal sagebrush, chamise, slender oat, longbeak stork's bill, black mustard, Sandberg's bluegrass (*Poa secunda*), and *Cryptantha* sp. The surface soil in the adjacent area is a brown (10 YR 4/3) loamy fine sand to a depth of 19 inches, and there was no evidence of wetland hydrology.

3.2.1.2 Area I SW-2 (PEMCh)

A second, larger constructed wetland feature, known locally as "horse pond," is near the northwestern corner of Area I (Figure 3-1). The NWI describes the pond as a permanently flooded, excavated wetland with Aquatic Bed vegetation, with adjacent areas mapped as saturated Palustrine Scrub-Shrub wetlands (Appendix C). Field observations indicate that this wetland is more accurately classified as a seasonally flooded Palustrine Emergent wetland that has been created by an impoundment. No adjacent Scrub-Shrub wetlands were identified in this area.

The 0.15-acre wetland is located near the base of a large sandstone outcrop. The basin appears to have been excavated, and an earthen berm has been constructed along the western edge that impounds surface water drainage from the hill slope above. An erosional channel, resulting from channelized runoff, extends approximately 250 feet to the northeast of the wetland (Figure 3-1). Vegetation within the wetland basin is dominated by annual rabbitsfoot grass (*Polypogon monspeliensis*), with lesser amounts of water-starwort (*Callitriche marginata*), tall flatsedge (*Cyperus eragrostis*), rough cocklebur (*Xanthium strumarium*), scarlet pimpernel, purslane speedwell (*Veronica peregrina* subsp. *xalapensis*), and pale spikerush (*Eleocharis macrostachya*). Surface soil is a dark grayish-brown (10YR 4/2), fine sandy loam to a depth of 2 inches underlain by a dark brown (10 YR 3/1) loamy fine sand with less than 2 percent yellowish-red (5 YR 5/6) inclusions in the soil matrix to a depth of 16 inches. Some brown (10 YR 5/3) sand also was observed on the soil ped surfaces between 2 and 9 inches. From 16 to 19 inches, the soil is a dark brown (10YR 4/3) sand. At the time of the January 2012 field survey, some shallow surface water was present in the lowest part of the basin, and a shallow water table was present about 18 inches below the surface, near the outer edge of the basin. Seasonal saturation and inundation were observed in this area during botanical surveys conducted in April and June 2011. Other hydrologic indicators included water marks on the adjacent sandstone rocks and drift deposits.

Vegetation in the adjacent areas includes laurel sumac, chamise, thickleaf yerba santa, black sage, and Sandberg's bluegrass, with sparse amounts of curly dock (*Rumex crispus*) and scarlet pimpernel. A dense thicket of poison oak is present on the earthen berm along the western side of the basin. Surface soil is a dark grayish-brown (10 YR 4/2) fine sandy loam to a depth of 1 inch that is underlain by a mixture of dark grayish-brown (10 YR 4/2) and yellowish-red (5 YR 5/6) fine sandy loam to a depth of 6 inches. From 6 to 17 inches, the soil is a mixture of dark brown (10YR 4/3), dark yellowish-brown (10 YR 4/6), and gray (10 YR 5/1) loamy fine sand. Soils in this area are likely the result of spoils created during the excavation of the pond area. No evidence of wetland hydrology

was observed. The wetland/upland edge is defined by a relatively abrupt topographic break, change in the dominant vegetation, and evidence of ordinary high water such as water marks and drift deposits.

3.2.1.3 R2B Pond (PUBCh)

The 0.13-acre R2B pond is in the southwestern portion of Area II (Figure 3-6). The pond was mapped by the NWI together with the R2A pond as a permanently flooded, excavated Palustrine Unconsolidated Bottom wetland (Appendix C). Field observations as well as topographic and hydrologic maps indicate that this smaller pond was created by impounding the Southwestern Drainage. Although this pond is flooded for much of the year, no surface water was observed in the basin during the August 2011 botanical survey. Therefore, this feature is more accurately classified as a seasonally flooded Palustrine Aquatic Bed wetland that is the result of an impoundment. The R2B pond physically is separated from the R2A pond by a concrete apron and earthen dam, and it appears to serve as a settling pond prior to discharging, via a 36-inch-diameter culvert, into the larger R2A pond to the east.

The bottom of the pond is covered with fallen dead stems of southern cattail (*Typha domingensis*), but most of the pond is characterized by open water. Sparse (senesced) southern cattail and tule (*Schoenoplectus* sp.) stems are present along the southern and western edges of the pond, but they provide only minimal cover. Arroyo willow (*Salix lasiolepis*) and mule fat also are present around the edges of the pond. Soils are very shallow to bedrock (5 inches) and are of dark grayish-brown (10YR 4/2) fine sandy loam. No redoximorphic features were observed. The pond partially was flooded at the time of the January 2012 field survey and had an estimated depth of 24 inches. Water staining and sediment deposits on the concrete apron and drift deposits on the mule fat branches indicate that ordinary high water appears to be around 4 feet deep.

Vegetation in the adjacent uplands includes arroyo willow, mule fat, coyotebrush, poison oak, orange bush monkey-flower, riggut brome, soft brome, and plumeless Italian thistle (*Carduus pycnocephalus*). The surface soil is a dark grayish-brown (10 YR 4/2) loamy fine sand to a depth of 18 inches. No redoximorphic features were observed, and there was no evidence of wetland hydrology. The wetland/upland edge is defined by changes in the dominant vegetation, presence and absence of ordinary high-water marks, and a relatively gradual transition to bedrock outcrop that surrounds the wetland on the western, southern, and eastern sides.

3.2.1.4 R2A Pond (PUBHx/PUBWx)

The 0.74-acre R2A pond is in the southwestern portion of Area II (Figure 3-6). This feature is mapped together with the R2B pond by the NWI as a permanently flooded, excavated Palustrine Unconsolidated Bottom wetland (Appendix C).

The R2A pond is a large constructed pond that receives inflows from the R2B pond via a 36-inch-diameter culvert on the western side and two ephemeral drainages on the eastern side (Figure 3-6). Water levels within the pond actively are managed through a system of pumps and large-volume plastic pipes (intake and outtake) used to transfer water between the R2A pond and the larger Silvernale pond, located to the north-northeast, outside the NASA-administered property. The water transfers are used to minimize surface water discharges into the Southwestern Drainage below the R2A pond. In the event that both the Silvernale and R2 ponds exceed their water storage capacities, there is an overflow spillway and constructed outfall along the southern side of the pond designed to capture sediment before the water is discharged into the downstream section of the Southwestern Drainage.

The western part of the pond was flooded with several feet of water at the time of the January 2012 survey. During previous biological surveys, in 2010 and 2011, surface water was observed at various levels, but the basin was never completely dry. With the exception of a few small patches of narrow-leaf cattail, the western part of the pond generally lacks emergent vegetation. The extent of the ordinary high water in this area was mapped based on water marks on the surrounding sandstone rocks.

The eastern portion of the pond was dry at the time of the January 2012 survey, and no surface water was observed in this part of the pond during any of the 2011 spring and summer botanical surveys. This part of the pond appears to be used only for excess water storage, and therefore, was considered to be only intermittently flooded. Extensive dead tule stems litter the bottom of the pond in this area, suggesting that at one time dense

emergent vegetation was present. Currently, vegetation is limited to a few small, scattered mule fat shrubs and occasional tall flat sedge. No live rhizomes or erect, senesced tule stems were present. The upper 2 inches of the soil consist of a very dark grayish-brown (10 YR 3/2) mixture of layered organic material, fine sand, and silt. From 2 to 6 inches, the soil is a mixed very dark grayish-brown (10 YR 3/2) and yellowish-brown loamy fine sand that is underlain by a very dark grayish-brown (10 YR 3/2) fine sandy loam with approximately 2-percent black (10 YR 2/1) and 8-percent dark yellowish-brown (10 YR 4/4) inclusions in the matrix. Although the eastern part of the pond was dry at the time of the survey and appears to be only intermittently flooded, water stains on the adjacent rocks were used to map the extent of the previous ordinary high-water level in this area.

Vegetation in the areas around the pond includes coast live oak, arroyo willow, mule fat, coyotebrush, poison oak, ripgut brome, and branching phacelia (*Phacelia ramosissima*). Surface soil is a very dark grayish-brown (10 YR 3/2) loamy fine sand to a depth of 2 inches underlain by a mixture of dark gray (10YR 4/1) and dark yellowish-brown (10YR 4/4) loamy fine sand to a depth of 14 inches. Between 14 and 24 inches, the soil is a brown (10 YR 4/3) loamy fine sand. No redoximorphic features were observed, and there was no evidence of wetland hydrology.

3.2.1.5 Coca Pond (PUBHx)

The Coca Pond is in the southeastern portion of Area II (Figures 3-5 and 3-6). This feature is mapped as a permanently flooded, excavated Palustrine Unconsolidated Bottom wetland by the NWI (Appendix C).

The 0.33-acre Coca Pond is a constructed pond at the downslope end of a shotcrete swale originating at the Coca test stands to the east (Figure 3-5). The shotcrete swale terminates in a settling basin southeast of the pond, on the southern side of a paved access road. Two 36-inch-diameter culverts that connect to the Coca pond are located in the bottom of the settling basin (Figure 3-5). These culverts were sealed closed at the time of the January 2012 site visit. An overflow discharge on the northern side of the pond empties into a concrete-lined ditch that conveys water west, where it passes beneath Test Area Road and enters a natural ephemeral drainage leading into the northeastern corner of the R2A pond (Figure 3-6).

Along the western side of the pond, some organic soils have accumulated along the concrete apron. In this area, as in others, primarily along the northern side of the pond, southern cattail is present, but it provides less than 30-percent cover. The organic soils are a black (10 YR 2/1) fine sandy loam to a depth of 10 inches with no redoximorphic features. Most of the pond is characterized by open water that was estimated to be between 3 to 4 feet deep at the time of the January 2012 survey. Surface water has been observed in this pond at various times throughout the year during previous biological surveys. The extent of the ordinary high-water mark was established based on water staining on the concrete lining and rocks around the pond.

Characteristic vegetation in the adjacent area includes laurel sumac, thicketleaf yerba santa, common deerweed, and branching phacelia. Surface soil is a dark yellowish-brown (10 YR 4/4) mixed with a small amount of very dark grayish-brown (10 YR 3/2) sandy loam to a depth of 10 inches. From 10 to 19 inches, the soil is a light olive brown (2.5 YR 5/4) sand. No redoximorphic features were observed, and there was no evidence of wetland hydrology.

3.2.2 Riverine Features

Wetlands classified as part of the Riverine (R) system include wetlands that are contained within a channel, with the exception of channelized wetlands dominated by trees, shrubs, or persistent emergent vegetation and channels containing ocean-derived salts in excess of 0.5 ‰. Under this system, a channel is defined as “an open conduit either naturally or artificially created which periodically or continuously contains moving water, or which forms a connecting link between two bodies of water” (Cowardin et al., 1979). All of the Riverine wetlands identified on the NASA-administered property are in the Intermittent Subsystem, which includes channels that contain flowing water for only part of the year. When water is not flowing, it might remain in isolated pools or surface water might be absent.

The Riverine wetlands identified on the NASA-administered property are included in the Stream Bed Class, a broad classification that includes a variety of substrates depending on the gradient of the channel, the velocity of the water, and the sediment load of the stream. Common stream bed substrates include bedrock rubble, cobble-gravel, sand, and mud. Although not specifically included in the classification system, for the purpose of this

report, sections of natural drainages that have been concrete lined were included in the Stream Bed Class. Water regimes associated with the Riverine Intermittent wetlands identified in the survey area include seasonally flooded and temporarily flooded. Descriptions of the Riverine wetlands are provided in the following subsections.

3.2.2.1 Northern Drainage (R4SBC)

The Northern Drainage passes through the southern portion of Area I and the northeastern portion of Area II (Figures 3-1 and 3-2). This drainage feature is shown as a blue line stream on the USGS Calabasas topographic quadrangle map and also is included in the NHD as an intermittent stream (Appendix D). The NWI has mapped this area as a temporarily flooded Palustrine Scrub-Shrub wetland (Appendix C). According to onsite staff, water often flows through this area for several months; therefore, this water feature is more appropriately classified as a seasonally flooded Riverine Intermittent Streambed wetland.

In the southeastern corner of Area I, the channel is confined by steep side slopes ranging from approximately 8 to 10 feet high. The approximately 8-foot-wide channel bed is characterized by a rocky-cobble substrate with some sand and gravel. Vegetation is largely absent with the exception of sparse scattered herbaceous species such as annual rabbitsfoot grass (*Polypogon monspeliensis*), plumeless Italian thistle, and curly dock. The channel was dry at the time of the January 2012 survey, but seasonal rainfall was below the average for this time of year. Evidence of flow observed during the survey included drift and debris deposits approximately 24 inches above the channel bottom in some areas, as well as the general absence of upland vegetation. At the western end of this reach, water flows through a 48-inch-diameter culvert under an old and abandoned unpaved roadway. The channel characteristics generally are similar downstream of the culvert, with steep banks and an approximately 8-foot-wide channel, but the substrate becomes more sandy and gravelly, with scattered cobble and sandstone rocks. Vegetation essentially is absent except for scattered seedlings of plumeless Italian thistle and black mustard. A small erosional channel, approximately 2 feet wide and along the southern bank, flows directly in the stream in this area (Figure 3-1). West of the erosional channel the stream enters a 52-inch-diameter culvert under the gravel access road to the Liquid Oxygen (LOX) site (Figure 3-1). East of the culvert the channel bed widens to an average of 12 feet and has a sandy substrate with gravel, cobble, and sandstone boulders present in scattered locations. As with other sections of this drainage, vegetation in this reach is sparse and includes scattered plumeless Italian thistle, smilgrass (*Piptatherum miliaceum*), annual rabbitsfoot grass, curly dock, and mule fat.

Coast live oak riparian vegetation is present along the upper banks of the channel throughout Area I. Coast live oak is the sole dominant tree in this area. One arroyo willow tree (approximately 5 inches in diameter at breast height) also is present along the drainage in Area I. Common shrubs along the upper banks include toyon (*Hertermeles arbutifolia*), chamise, poison oak, mule fat, coastal sagebrush, thickleaf yerba santa, Mendocino bush mallow, hoaryleaf ceanothus (*Ceanothus crassifolius*), American black elderberry (*Sambucus nigra* ssp. *caerulea*), and chaparral current (*Ribes malvaceum*). Herbaceous species include smilgrass, branching phacelia, black mustard, plumeless Italian thistle, and bedstraw (*Galium* sp.).

In the northeastern corner of Area II, the channel width ranges between 6 and 14 feet (average width of 9 feet), with defined side banks in most areas. The channel substrate along the eastern boundary of the site is sandy, with scattered cobble and sandstone rock. As the channel continues to the west, the substrate becomes rockier, with some sections of the channel characterized by large sandstone boulders. Throughout Area II, vegetation is absent to sparse and includes scattered mule fat, annual rabbitsfoot grass, plumeless Italian thistle, smilgrass, curly dock, and orange bush monkey flower. The entire reach of the channel through Area II was dry during the January 2012 surveys, but there was evidence of flow, including drift and debris deposits and an absence of vegetation. No culverts are present in this section of the drainage. There is one ephemeral tributary (the Expendable Launch Vehicle [ELV] Drainage) that enters the stream east of the ELV Site (Figure 3-2).

Coast live oak riparian woodland is present along the upper banks of the channel throughout Area II. Coast live oak is the dominant tree species, but scattered arroyo willow and California laurel (*Umbellularia californica*) trees are present in some areas. Shrub species along the upper banks include toyon, heart-leaved penstemon (*Keckiella cordifolia*), poison oak, California blackberry (*Rubus ursinus*), orange bush monkey flower, birchleaf mountain mahogany (*Cercocarpus betuloides*), and black sage. Common herbaceous species include smilgrass, plumeless Italian thistle, and branching phacelia.

3.2.2.2 ELV Drainage (R4SBA)

The ELV Drainage is east of the ELV Site and helicopter landing area, in the northeastern part of Area II. This drainage is a direct tributary to the Northern Drainage (Figure 3-2). Upstream of the confluence with the Northern Drainage, the channel bed width ranges from approximately 4 to 10 feet and is characterized by a sandy-gravel substrate, devoid of vegetation. The upper section of this drainage, parallel to F Street, has been lined with asphalt. Large sandstone rocks and boulders also occur in some sections of the channel. Abundant downed woody debris is present in the upper reaches of the channel, particularly in the section that parallels F Street. Flows in this area appear to be temporary, short-duration events in response to storm events. Evidence of flow in this area included some areas of scouring and debris deposits.

Common vegetation along the upper slopes of the channel includes coast live oak, California laurel, poison oak, Mendocino bush mallow, hairy ceanothus (*Ceanothus oliganthus*), chamise, toyon, laurel sumac, coastal sagebrush, canyon sunflower (*Venegasia carpesioides*), orange bush monkey flower, chaparral current, California wildrose (*Rosa californica*), smilgrass, plumeless Italian thistle, and branching phacelia. Two additional channels, Drainage A-1 and Drainage A-2, also flow into this feature (Figure 3-2).

3.2.2.3 Drainage A-1 (R4SBA)

Drainage A-1 is in the northeastern part of Area II and is a tributary to the ELV Drainage (Figure 3-2). On the southern side of F Street are a large amount of boulder riprap and a 29-inch plastic culvert. In the immediate vicinity of the riprap and culvert, the area is a low topographic swale. The only defined drainage feature in this area is a narrow (1- to 2-foot-wide) sandy channel with scattered cobbles that extends east through relatively dense chaparral vegetation (Figure 3-2). It is likely that this area receives additional overland stormwater flows from the hill slope to the south. On the northern side of the road, the channel is approximately 7.5 feet wide with a sandy-cobble substrate, with some asphalt debris also present. No vegetation was present in the channel north of F Street. Evidence of flow in this area included a relatively defined, unvegetated channel and sparse debris deposits. It is likely that this drainage conveys only temporary, short-duration surface flow in response to major storm events.

Vegetation along the channel includes coast live oak, Mendocino bush mallow, chaparral current, laurel sumac, coyotebrush, thickleaf yerba santa and black sage, branching phacelia, and plumeless Italian thistle.

3.2.2.4 Drainage A-2 (R4SBA)

Drainage A-2 is on the southern side of F Street and is tributary to the ELV Drainage via a 24-inch-diameter culvert (Figure 3-2). The channel immediately south of the road is approximately 6 feet wide and has a defined bed and bank, but as it continues south, it gradually becomes a much smaller discontinuous erosional feature. The channel on the southern side of F Street has a sandy substrate that is largely devoid of vegetation with the exception of scattered small poison oak and orange bush monkey flower plants growing along the upper edges of the banks in the area near the road. On the northern side of the road, the culvert discharges into an asphalt drainage ditch. No evidence of recent flow was noted in the channel at the time of the survey.

Adjacent vegetation includes coast live oak, poison oak, plumeless Italian thistle, giant ryegrass (*Elymus condensatus*), branching phacelia, rigput brome, and two-color rabbit tobacco (*Pseudognaphalium biolettii*).

3.2.2.5 Southwestern Drainage (R4SBA)

The Southwestern Drainage originates just beyond the western edge of the Alfa test stand, where it traverses from east to west through the central-north portion of Area II and around the northern side of the Storage Propellant Area (SPA) site (Figure 3-3). In this area the drainage is indicated as a blue line stream (called Bell Creek) on the Calabasas USGS topographic quadrangle maps and also is shown as an intermittent stream in the NHD. The NWI maps also indicate sections of the drainage as seasonally flooded Palustrine Scrub-Shrub wetlands (Appendix C). The upper reaches of the drainage have been highly altered by culverts, weirs, and earthen dams. In this area there is no defined channel, and no ordinary high-water-mark indicators were observed during the January 2012 survey.

The eastern section of the drainage originates at a 24-inch-diameter culvert outfall near the Alfa test stands (Figure 3-3). At the outfall, more than half of the culvert was filled with sediment and there is no defined channel or evidence of scouring immediately downstream of this location. Vegetation below the outfall is dominated by common iceplant (*Mesembryanthemum crystallinum*), with scattered black mustard and plumeless Italian thistle intermixed.

West of the culvert outfall there is no defined bed and bank feature; rather, the drainage is a characterized low sandy topographic swale that lacks evidence of flowing water, but vegetation within the swale includes riparian species such as mule fat and arroyo willow. Many of the willows were burned and dead as a result of the 2005 Topanga Canyon Fire, and overall, the willows and mule fat appeared to be in poor condition throughout this area.

Upland species including common iceplant, plumeless Italian thistle, ripgut brome, crimson fountain grass (*Pennisetum setaceum*), slender oat and Maltese star-thistle (*Centaurea melitensis*) also were abundant throughout the eastern section of the swale.

Southwest of the westernmost Alfa test stand is a concrete check dam along the swale feature (Figure 3-3). On the southern side of the check dam is a 36-inch-diameter corrugated metal pipe outflow that runs from the top of the check dam west along the hillside on the southern side of the swale (Figure 3-3). A second culvert, with an apparently inoperable flow valve and also located at the check dam, appears to connect to the downstream swale below the dam. Beyond the check dam, the drainage continues along a weakly expressed sandy swale that lacks a defined bed and bank. Most arroyo willows downstream of the dam were burned in the 2005 fire, and no resprouting or regeneration was evident. Most of the swale downstream of the dam is choked with dead woody debris, with scattered mule fat and abundant plumeless Italian thistle.

An earthen dam is approximately 275 feet downstream (west) of the concrete check dam (Figure 3-3). The culvert that runs along the southern side of the swale from the check dam discharges down a concrete spillway on the western side of the earthen dam. There is also a low-flow release valve at the base of the earthen dam, although the valve appeared to be inoperable at the time of the survey. As with the other sections of the Southwest Drainage through the Alfa site, the drainage downstream of the earthen dam is a low topographic swale with no defined bed and bank channel. Vegetation below the earthen dam is a mixture of mule fat, poison oak, and plumeless Italian thistle.

Approximately 500 feet west of the earthen dam, the swale terminates in a broad flat area east of an unpaved road and the former (now capped) Alfa/Bravo skim pond. Immediately west of the former skim pond is a concrete headwall and two 24-inch-diameter culverts, both filled more than half way with sediment. The culvert outfalls were not found during the January 2012 survey, but presumably they drain into the sandy, swale that continues from this area west to CLT IV Road. Vegetation within the swale feature west of the double culverts includes arroyo willow, mule fat, coyotebrush, poison oak, Mendocino bush mallow, Douglas's sagewort (*Artemisia douglasiana*), plumeless Italian thistle, and branching phacelia.

At CLT IV Road, the swale terminates at a 50-inch-diameter culvert that passes under the road. On the western side of the road, the culvert discharges into a concrete-lined drainage channel that runs along the northern side of the SPA site (Figure 3-2). The first approximately 50 feet of the concrete drainage channel in this area is nearly completely filled with soil. Slumped soils also were noted in other areas of the channel north of the SPA site. The soil in the concrete channel appears to have come from the SPA site and might be the result of erosion from firefighting activities during the 2005 Topanga Canyon fire. Vegetation along the concrete-lined channel includes thickleaf yerba santa, laurel sumac, coyotebrush, hoaryleaf ceanothus, chamise, poison oak, and mule fat.

The concrete channel terminates approximately 450 feet west of the CLT VI Road (Figure 3-3). West of the concrete-lined drainage channel, the natural channel is approximately 6 feet wide and has a sandy-rocky substrate with some gravel. Evidence of ordinary high-water flows such as drift lines, sediment deposits, and scoring were observed in this section of the drainage. Vegetation generally is absent in the bed of the channel, with the exception of the scattered annual rabbitsfoot grass and plumeless Italian thistle. The natural drainage channel continues west for less than 200 feet before exiting the NASA-administered property (Figure 3-3).

Outside of the NASA-administered property, the drainage turns south and passes through the Silvernale Pond before it continues southward toward the R2B Pond. At the point where drainage re-enters the NASA-administered property, the channel is approximately 5 feet wide with a sandy-gravel cobble substrate that is largely devoid of vegetation other than occasional seedlings of plumeless Italian thistle, black mustard, and blessed milkthistle (*Silybum marianum*). Evidence of ordinary high water in this area consisted primarily of a defined bed and bank channel, some scouring along the channel, and a general absence of upland vegetation. Vegetation along the sides of the channel includes coast live oak, laurel sumac, thicketleaf yerba santa, coyotebrush, and a few small arroyo willow seedlings and saplings. The channel immediately north of the R2B pond was inaccessible because of a dense thicket of poison oak.

As described previously, the Southwest Drainage is diverted into the R2B and R2A ponds, where water storage actively is regulated through a system of pumps and pipes to minimize outflows from the NASA-administered property. A constructed discharge designed to capture sediments is located along the southern side of the R2A pond and leads back into the natural drainage channel in the southwestern corner of Area II (Figure 3-6). Downstream of the constructed outfall, the channel is approximately 10 feet wide devoid of vegetation, and consists of a sand-gravel-cobble substrate with some large sandstone boulders. Vegetation along the upper banks of the channel includes coast live oak, mule fat, coyotebrush, poison oak, heart-leaved penstemon, laurel sumac, hoaryleaf ceanothus, thicketleaf yerba santa, and chaparral current. Herbaceous vegetation is generally sparse and consists of smilgrass and branching phacelia.

Approximately 280 feet of the channel in this section downstream of the R2A Pond was inaccessible because of large sandstone boulders within the channel. The channel area downstream of the large boulders is similar to the area upstream. Scattered vegetation in the sandy-gravel channel in this area includes Douglas' sagewort, curly dock, smilgrass, and plumeless Italian thistle. A small section of the channel meanders west, off of the NASA-administered property (Figure 3-6). Near the point where the drainage re-enters the property, the channel broadens slightly to approximately 14 feet, and the substrate becomes slightly more cobblely. In some areas of the channel, smilgrass is locally abundant. Along the southwestern property boundary, the channel makes a sharp (90-degree) turn to the east, resulting in a highly eroded bank. The channel in this area is approximately 10 feet wide with a sand-gravel-cobble substrate. Scattered vegetation within the channel includes smilgrass, black mustard, plumeless Italian thistle, and California blackberry. Vegetation along the sides of the channel in the southwestern corner of Area II includes coast live oak, California sycamore (*Platanus racemosa*), poison oak, laurel sumac, and creeping snowberry.

3.2.2.6 Southwestern Drainage Tributary (R4SBA)

A small tributary to the Southwestern Drainage originates from west of the NASA-administered Area II near the former Systems Test Laboratory (STL)-IV site (Figure 3-6). The channel is 4 feet wide and has a sandy substrate devoid of vegetation. Evidence of flow includes a well-defined bed and back channel debris deposits and the absence of vegetation. Vegetation along the channel includes coast live oak, coyotebrush, hoaryleaf ceanothus, chaparral current, chamise, plumeless Italian thistle, and black mustard.

3.2.2.7 Coca Drainage (R4SBA)

The Coca drainage originates at the base of the Coca test stands, where the eastern section is characterized by a shotcrete swale that drains into a retention basin connected via culverts to the Coca Pond (Figure 3-5). This feature is shown as a blue line on the USGS Calabasas quadrangle map and is included as an intermittent stream in the NHD and NWI.

To the north and west of the Coca Pond, the channel is contained within an approximately 10-foot-wide concrete-lined ditch. The ditch continues to Test Area Road, where water is conveyed through two culverts (42- and 24-inch diameters), as shown in Figure 3-6. At the culvert outfall, on the western side of the road, the natural channel is approximately 10 feet wide and characterized by a sandstone bedrock bed with some sand and gravel. Sparse mule fat and scattered black mustard and plumeless Italian thistle are present in the channel in this area. As the channel continues west, the substrate becomes more sandy and gravelly, with some large sandstone boulders, and is devoid of vegetation. A few plunge pools with approximately 6 inches of water were observed in this area.

during the January 2012 survey. Just upstream of the R2A pond, the channel width broadens to approximately 14 feet and is characterized by a sand-and-gravel substrate devoid of vegetation. The channel ultimately discharges into the northern end of the R2A pond overflow area (Figure 3-6).

Vegetation along the concrete-lined portion of the drainage ditch is characterized by common deerweed, Eastern Mojave buckwheat (*Eriogonum fasciculatum* var. *fasciculatum*), black mustard, coyotebrush, thistleleaf yerba santa, Mendocino bush mallow, poison oak, laurel sumac, and mule fat. West of Test Area Road, vegetation along the channel is characterized by scattered coast live oak trees as well as thistleleaf yerba santa, laurel sumac, chaparral current, orange bush monkey flower, coyotebrush, branching phacelia, plumeless Italian thistle, black mustard, smilgrass, and two-color rabbit tobacco.

3.2.2.8 PLF Drainage (R4SBA)

This small drainage feature originates at the base of a large sandstone cliff in the northeastern portion of the Delta site (Figure 3-6). The upstream part of the channel is 1 to 2 feet wide and 6 to 12 inches deep. As the channel continues west, it broadens to 3 feet in some areas and becomes more swale-like. The substrate is primarily sand with a few scattered cobbles, and is devoid of vegetation. At the western terminus, the drainage feature empties into a concrete apron and 24-inch-diameter culvert that eventually discharges near the eastern end of the R2A pond. This channel flows through a live oak woodland with an understory of poison oak, chaparral current, coastal sagebrush, canyon sunflower, branching phacelia, ripgut brome, smilgrass, and plumeless Italian thistle.

3.3 Nonwetland Features

A number of features were investigated during the survey that were not considered to be waters of the U.S. Such features included constructed stormwater swales associated with developed areas, culverts at road crossings that were not associated with defined drainage channels, and discontinuous erosional channels and weakly expressed upland swale on the hill slopes. Additionally, former skim ponds that have been capped and a former (now dry) basin that had been used to burn off excess fuels were not considered to be waters of the U.S.

3.4 Preliminary Jurisdictional Determination

The USACE ultimately is responsible for determining the limits of waters of the U.S. subject to regulation under the federal CWA. The results and conclusions presented in this wetland delineation are intended to assist the USACE with its determination of jurisdictional waters of the U.S. The results and conclusions presented in this report are preliminary, pending verification and subsequent approval by the USACE.

The small excavated wetland in the northeastern part of Area I and the larger impounded wetland and associated erosional channel in the northwestern part of Area 1 appear, on the basis of the site investigation, to be isolated. There does not appear to be any significant nexus between these constructed basins and any waters of the U.S. Therefore, these wetlands might not be considered jurisdictional waters of the U.S. subject to regulation under Section 404 of the federal CWA.

The jurisdictional status of the section of the Southwest Drainage through the Alfa site (Figure 3-3) is uncertain. This area lacks a defined bed and bank and there was no evidence of an ordinary high-water flow throughout this section. However, this area appears to be a natural drainage, has been mapped as a blue line on the USGS Calabasas topographic quadrangle, and is included as an intermittent stream in NHD. Although it appears that the natural hydrology has been altered significantly in this area, it could still be considered a water of the U.S. because it is considered part of the Southwestern Drainage, and remnants of the natural drainage are still present. In contrast, the easternmost section of the Coca drainage characterized by a shotcrete swale has been altered so dramatically from its original condition that it is unlikely that this section would be considered a water of the U.S. The cement-lined drainage that originates at the Coca Pond and extends west, eventually becoming a natural drainage, is likely to be considered jurisdictional.

Other drainage features identified on the NASA-administered property include extant natural drainages, some of which have been realigned and lined with concrete, but that appear to be natural tributary drainages that would be jurisdictional, and therefore, subject to regulation under Section 404 of the CWA. The R2A, R2B, and Coca ponds appear to have been created along the natural drainage channels and therefore might be considered either impoundments of waters of the U.S. or adjacent to waters of the U.S.

SECTION 4

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Appendix A Climate Data

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APPENDIX A

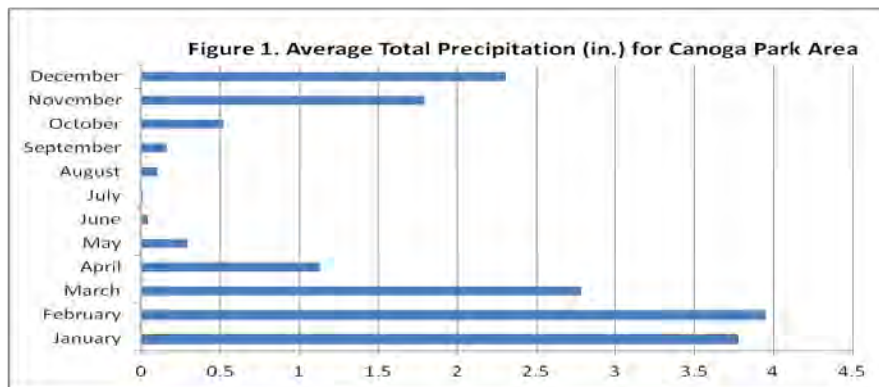
Canoga Park Pierce Coll, California (041484)**Period of Record Monthly Climate Summary**

Period of Record: 7/ 1/1949 to 8/10/2011

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	67.9	70.0	72.3	76.8	81.1	87.4	94.9	95.4	91.7	84.0	74.8	68.8	80.4
Average Min. Temperature (F)	39.3	40.7	41.9	44.6	49.1	53.0	57.0	57.3	54.6	49.0	42.6	38.8	47.3
Average Total Precipitation (in.)	3.78	3.95	2.78	1.13	0.29	0.04	0.01	0.10	0.16	0.52	1.79	2.31	16.86
Average Total Snow Fall (in.)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Average Snow Depth (in.)	0	0	0	0	0	0	0	0	0	0	0	0	0

Percent of possible observations for period of record.

Max. Temp.: 99.9% Min. Temp.: 99.9% Precipitation: 99.7% Snowfall: 99.9% Snow Depth: 99.9%

Check [Station Metadata](#) or [Metadata graphics](#) for more detail about data completeness.Western Regional Climate Center, wrcc@dri.edu

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Appendix B Soil Descriptions

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APPENDIX B

Soil Official Series Descriptions

Gaviota Series

LOCATION GAVIOTA CA
 Established Series
 Rev. GWH/CAF/KP
 10/2007

The Gaviota series consists of very shallow or shallow, well drained soils that formed in material weathered from hard sandstone or meta-sandstone. Gaviota soils are on hills and mountains and have slopes of 2 to 100 percent. The average annual precipitation is about 20 inches and the mean annual temperature is about 60 degrees F.

TAXONOMIC CLASS: Loamy, mixed, superactive, nonacid, thermic Lithic Xerorthents

TYPICAL PEDON: Gaviota gravelly loam, grass range. (Colors are for dry soil unless otherwise noted.)

A1--0 to 6 inches; brown (7.5YR 5/4) gravelly loam, brown (7.5YR 4/4) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine roots; common very fine tubular pores; neutral (pH 7.0); clear smooth boundary.

A2--6 to 10 inches; brown (7.5YR 5/4) gravelly loam, brown (7.5YR 4/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; common very fine tubular pores; neutral (pH 6.8); abrupt wavy boundary.

R--10 to 17 inches; pale brown (10YR 6/3) hard meta-sandstone.

TYPE LOCATION: Stanislaus County, California; nine miles west of the town of Westley, California; 1,700 feet north and 500 feet east of the southwest corner of section 6, T. 5 S., R. 6 E., MDB&M; USGS Solyo, California Quadrangle, NAD 27.

RANGE IN CHARACTERISTICS: Depth to a lithic contact of hard rock is 6 to 20 inches. The soils become moist below a depth of 6 inches some time between mid-October and mid-December and remain moist all the time in some parts below 6 inches until early April or late May. The mean annual soil temperature is 59 to 64 degrees F. and the soil temperature does not go as low as 41 degrees F. at any time. Texture throughout is sandy loam, fine sandy loam, loam, gravelly sandy loam, gravelly fine sandy loam, and gravelly loam. Clay content is 10 to 18 percent. Rock fragment content is less than 25 percent. Sand content is more than 40 percent of the fine earth fraction. Coarse and very coarse sand content is less than 20 percent.

The A horizon has color of 10YR 6/2, 6/3, 6/4, 5/2, 5/3, 5/4, 5/6, 5/8, 4/3; 2.5Y 6/2, 6/4, 5/2; 7.5YR 5/2, 5/4 or 6/4. Moist values are 4 throughout or if less than 4 they occur only in the upper part or have dry values of 6 or more. Reaction is moderately acid to neutral. Some pedons have a C horizon that differs from the A horizon principally by being one value unit lighter.

COMPETING SERIES: These are the [Daulton](#) , [Exchequer](#) (CA), [Ocraig](#) (CA), [Snook](#) (CA) and [Whiterock](#) (CA) series. Daulton soils have moist value of 3 and have a massive and hard epipedon. Exchequer soils have less than 50 percent sand in the fine earth fraction. Ocraig soils are neutral, have greater than 20 percent coarse and very coarse sand content. Snook soils are dry in all parts from early June to mid October. Whiterock soils have 25 to 50 percent sand and a mean annual soil temperature of 63 to 67 degrees F.

GEOGRAPHIC SETTING: Gaviota soils are on hills and mountains. Slope is 2 to 100 percent. These soils formed in material weathered from sandstone and meta-sandstone. Elevation is 200 to 4,400 feet. Rock outcrops are commonly associated with this soil and occupy from less than 2 percent to 50 percent of the surface area. The climate is dry subhumid with hot dry summers and cool moist winters. Mean annual precipitation is 10 to 30 inches. Mean January temperature is about 42 degrees F. and about 56 degrees F. along the coast of California; mean July temperature is about 75 degrees F.; mean annual temperature is about 56 to 65 degrees F. The frost-free season is 175 to 350 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the [Altamont](#), [Los Gatos](#), [Los Osos](#), [Vallecitos](#) and [Wadesprings](#) soils. Altamont soils, on uplands, hills and mountains, have a fine particle-size control section. Los Gatos soils, on mountains, are moderately deep and have an argillic horizon. Los Osos soils, on uplands, have an argillic horizon and a paralithic contact at a depth of 20 to 40 inches. Vallecitos soils, on hills, have an argillic horizon and a clayey particle-size control section. Wadesprings soils, on uplands, have an argillic horizon and magnesian mineralogy.

DRAINAGE AND PERMEABILITY: Well and excessively well drained; very low to very high runoff; moderately rapid permeability.

USE AND VEGETATION: Used mostly for livestock grazing. Some of the less sloping areas are cropped to dryland grain. Natural vegetation is California sage, chamise, manzanita, purple needlegrass and annual grasses.

DISTRIBUTION AND EXTENT: Mostly in the California Coast Ranges. The soils are extensive. MLRA 15, 20.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Davis, California

SERIES ESTABLISHED: Stanislaus County (Newman Area), California, 1941.

REMARKS: Soils in the Amargosa series as recognized in the Antelope Valley Area, California are not included in the Gaviota series. Soils formed in material weathered from granite are now excluded from the Gaviota series.

The revision made on 09/96 moves the type location to better represent the series as mapped for the Gaviota series.

CEC/Clay ratio estimated from similar soils with laboratory data in the W. Stanislaus Soil Survey Area.

Runoff terminology adjusted 4/96 to adjective criteria of the Soil Survey Manual, 10/93.

Competing series updated 01/2003.

Warmer January temperatures occur along the southern Coastal range. These were phased until a possible later decision to split these out as separate series.

National Cooperative Soil Survey
U.S.A.

SAUGUS SERIES

LOCATION SAUGUS

CA

Established Series

Rev. GAW/RCH/LCL/ET

03/2003

The Saugus series consists of deep, well drained soils that formed from weakly consolidated sediments. Saugus soils are on dissected terraces and foothills and have slopes of 9 to 50 percent. The mean annual precipitation is about 16 inches and the mean annual air temperature is about 63 degrees F.

TAXONOMIC CLASS: Coarse-loamy, mixed, superactive, nonacid, thermic Typic Xerorthents

TYPICAL PEDON: Saugus loam, brush and grass. (Colors are for dry soil unless otherwise stated.)

A1--0 to 15 inches; grayish brown (10YR 5/2) loam, dark grayish brown (10YR 4/2) moist; weak fine subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common very fine medium and coarse roots; common very fine, few fine tubular and common very fine interstitial pores; about 5 percent gravel by volume; neutral (pH 6.8); gradual smooth boundary. (8 to 17 inches thick)

C1--15 to 25 inches; grayish brown (10YR 5/2) loam, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few very fine, common coarse roots; few very fine tubular, common very fine interstitial pores; about 15 percent gravel by volume; slightly acid (pH 6.5); gradual smooth boundary. (10 to 14 inches thick)

C2--25 to 42 inches; grayish brown (10YR 5/2) loam, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few very fine, common fine and few coarse roots; few very fine tubular, common very fine interstitial pores; contains about 10 percent gravel by volume; slightly acid (pH 6.5); diffuse smooth boundary. (16 to 25 inches thick)

C3--42 to 50 inches; grayish brown (10YR 5/2) weakly consolidated sediments that crush to gravelly heavy sandy loam, dark grayish brown (10YR 4/2) moist; massive; hard, friable, slightly sticky and slightly plastic; few very fine interstitial pores; about 25 percent gravel and 5 percent cobbles; slightly acid (pH 6.3).

TYPE LOCATION: Los Angeles County, California; in Romero Canyon; NW1/4 NW1/4 section 27, T.5N., R.17W.

RANGE IN CHARACTERISTICS: Depth to a paralithic contact is 40 to 56 inches. Saugus soils are on complex slopes of 9 to 50 percent. The mean annual soil temperature at a depth of 20 inches is 60 degrees F. and the soil temperature is not below 47 degrees F. at any time. Soil between depths of about 5 and 15 inches is continuously dry in all parts from late April or May until late October to early December and is moist in some or all parts all the rest of the year. The soil profile is loam or sandy loam throughout and the 10 to 40 inch control section has less than 18 percent clay. Rock fragments range from 1 to 35 percent and are mostly gravel and a few cobbles. Usually the amount of rock fragments increases with depth, though in some pedons the immediate surface has a partial layer of fragments. The profile is slightly acid to slightly alkaline and in many pedons the lower part is less acid.

The A horizon is light brownish gray, grayish brown, yellowish brown, brown or pale brown in 10YR or 2.5Y hue when dry. The moist value is 4 or 5. In some pedons the upper 1 to 4 inches is gray, dark gray or dark grayish brown. The upper 7 inches of the A horizon has 0.4 to 1.0 percent organic matter.

The C horizon above the paralithic contact has a color similar to the A horizon or it has one unit higher value.

COMPETING SERIES: These are the [Escondido](#), [Hanford](#), [Honcut](#), [Pollasky](#), [Pfeiffer](#), [San Andreas](#), and [Vista](#) series. Escondido and Vista soils have a cambic horizon. Hanford and Honcut soils are on smooth slopes of less than 9 percent and they lack a paralithic contact. Pfeiffer and San Andreas soils have a mollic epipedon. Pollasky soils have a paralithic contact at depths of less than 40 inches.

GEOGRAPHIC SETTING: The Saugus soils are on slopes of dissected terraces and foothills at elevations of 600 to 2,500 feet. Slopes range from 9 to 50 percent. The soils formed in material weathered from weakly consolidated sediments mostly from granitic and closely related rocks. The climate is dry subhumid mesothermal with warm dry summers and cool moist winters. The mean annual precipitation is 14 to 20 inches all in the form of rain. Mean annual temperature is about 63 degrees F., average January temperature is about 54 degrees F., and average July temperature is about 73 degrees F. The freeze-free season is about 250 to 300 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the [Castaic](#), [Gaviota](#), [Metz](#), [San Andreas](#), and [Sorrento](#) soils. Castaic soils have more than 18 percent clay and have a fine-silty control section. Gaviota soils have a lithic contact less than 20 inches below the surface. Metz soils are sandy and are stratified with layers of finer texture.

DRAINAGE AND PERMEABILITY: Well drained; medium to rapid runoff; moderate permeability.

USE AND VEGETATION: Used for grazing, wildlife, watershed, and small amounts used for industry and urbanization. Native vegetation is chamise and other shrubs plus minor amounts of perennial grasses. Naturalized grasses and forbs make up a small to large portion of the vegetation.

DISTRIBUTION AND EXTENT: Foothills in the western part of southern California. The soils are of moderate extent.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Davis, California

SERIES ESTABLISHED: San Bernardino County (Southwestern Part), California, 1972.

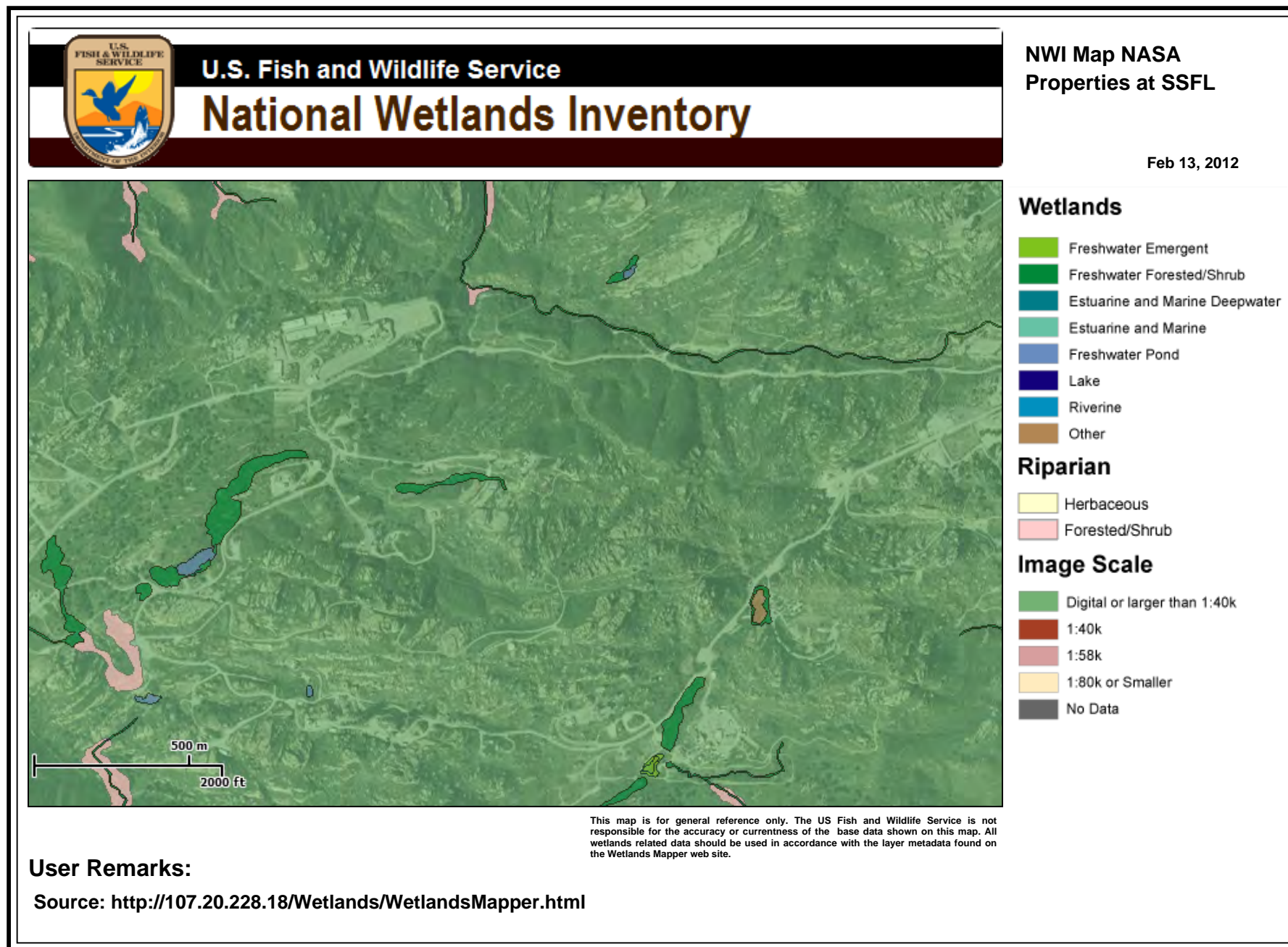
REMARKS: The activity class was added to the classification in February of 2003. Competing series were not checked at that time. - ET

OSD scanned by SSQA. Last revised by state on 10/75.

National Cooperative Soil Survey
U.S.A.

Appendix C National Wetland Inventory Map

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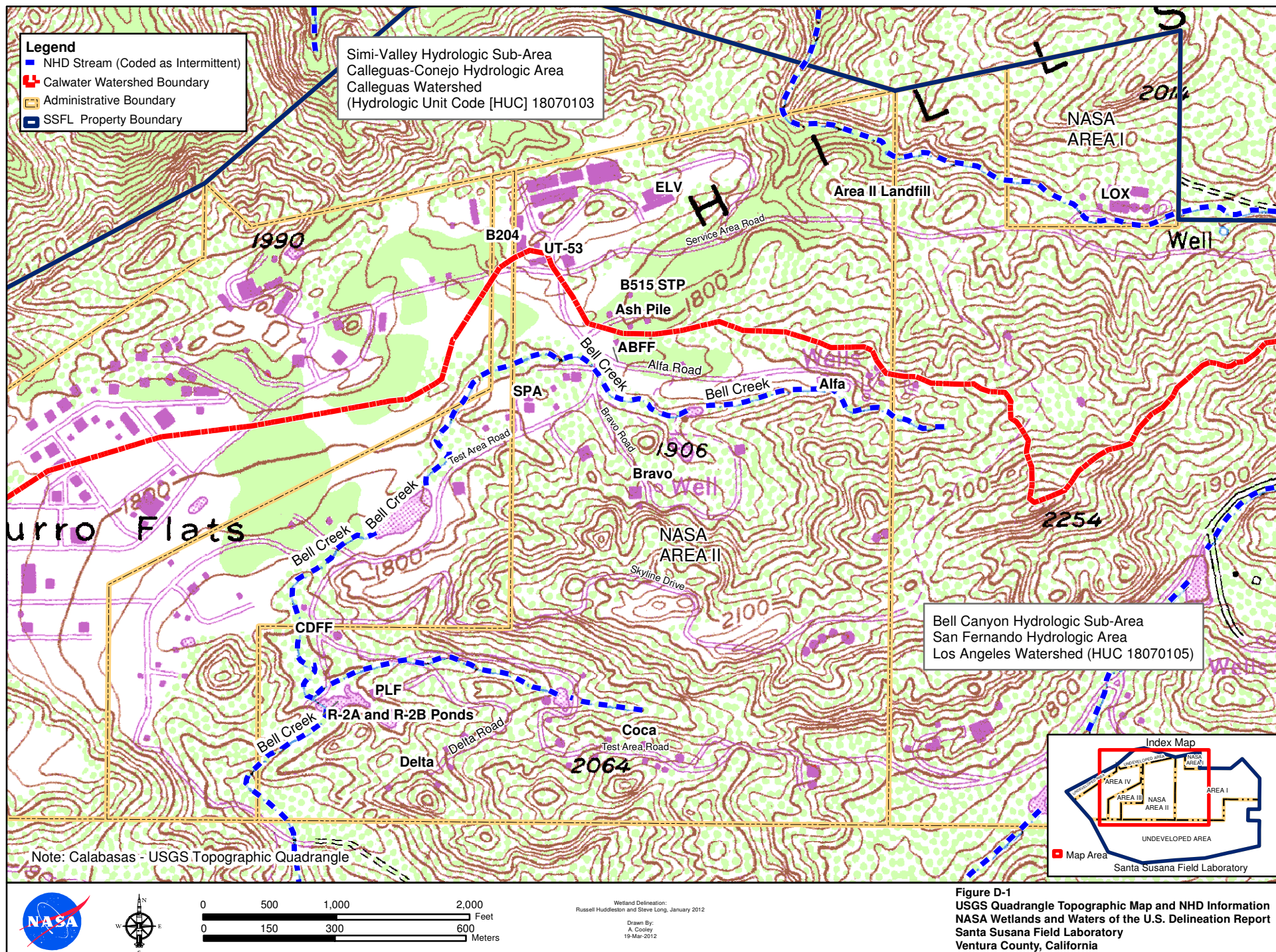


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Appendix D

USGS Quadrangle Topographic Map and NHD Information

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Appendix E Wetland Determination Data Sheets

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WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: SSFL - COCA POND City/County: VENTURA CO. Sampling Date: 1/3/2012
 Applicant/Owner: NASA State: CA Sampling Point: COCA SP-1
 Investigator(s): R. HUDDLESTON, S. LONG Section, Township, Range: 02N 17W SEC 30 (SBM)
 Landform (hillslope, terrace, etc.): TERRACE Local relief (concave, convex, none): CONCAVE Slope (%): 0-2%
 Subregion (LRR): C Lat: 34° 13' 36.786" Long: 118° 42' 02.091 Datum: NAD 83
 Soil Map Unit Name: Su6 SEDIMENTARY ROCK LAND NWI classification: PUBHX

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/>	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Remarks: <u>BELOW AVE RAINFALL TO DATE</u>	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0' <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
_____ = Total Cover	_____	_____	_____	
Sapling/Shrub Stratum (Plot size: _____)	_____	_____	_____	Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	Remarks: <u>TIPHA ONLY AROUND EDGES OF THE POND - MOST OF THE AREA IS OPEN WATER</u>
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
Herb Stratum (Plot size: <u>0.5m²</u>)	_____	_____	_____	
1. <u>TIPHA DOMINGENSIS</u>	<u>60%</u>	<u>Y</u>	<u>OBL</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover	_____	_____	_____	
Woody Vine Stratum (Plot size: _____)	_____	_____	_____	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____ = Total Cover	_____	_____	_____	
% Bare Ground in Herb Stratum <u>40</u>	% Cover of Biotic Crust _____			

SOIL

Sampling Point: COCA SP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

[illegible]

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

Indicators for Problematic Hydric Soils³:

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 1 cm Muck (A9) (LRR C)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> 2 cm Muck (A10) (LRR B)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> Reduced Vertic (F18)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Stratified Layers (A5) (LRR C)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> 1 cm Muck (A9) (LRR D)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Vernal Pools (F9)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)		

³Indicators of hydrophytic vegetation wetland hydrology must be present unless disturbed or problematic

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: NE

Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

SEDIMENTS ACCUMULATED AT BASE OF CRMENT SLOPE
BELOW THE LEVEL OF THE POND CHAIN LINE

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

Secondary Indicators (2 or more required)

<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Water Marks (B1) (Riverine)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Biotic Crust (B12)	<input type="checkbox"/> Sediment Deposits (B2) (Riverine)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Drift Deposits (B3) (Riverine)
<input checked="" type="checkbox"/> Water Marks (B1) (Nonriverine)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Sediment Deposits (B2) (Nonriverine)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Drift Deposits (B3) (Nonriverine)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☒ No ☐ Depth (inches): ?

Water Table Present? Yes ☐ No ☒ Depth (inches): 10

Saturation Present? Yes _____ No _____ Depth (inches): _____
(includes capillary fringe)

Wetland Hydrology Present? Yes X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WATER IN POND JUST BELOW SAMPLE POINT

WATER MARK ON CEMENT ~ 2 FT ABOVE SAMPLE POINT

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland?	Yes _____ No <u>X</u>
Hydric Soil Present?	Yes _____ No <u>X</u>		
Wetland Hydrology Present?	Yes _____ No <u>X</u>		
Remarks: <u>BELOW AVE DRAINAGE</u>			

Tree Stratum (Plot size: _____)		Absolute % Cover	Dominant Species?	Indicator Status
1.				
2.				
3.				
4.				
		_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: <u>2m²</u>)				
1.	<u>MALOSOMA LAURINA</u>	<u>5%</u>	<u>Y</u>	<u>ML</u>
2.	<u>ERIODICTYON CRASSIFOLIUM</u>	<u>2%</u>	<u>Y</u>	<u>ML</u>
3.				
4.				
5.				
		_____ = Total Cover		
Herb Stratum (Plot size: <u>1m²</u>)				
1.	<u>LEPUS SCOPARIUS</u>	<u>90%</u>	<u>Y</u>	<u>ML</u>
2.	<u>PHACELIA RAMOSISSIMA</u>	<u>5%</u>		<u>ML</u>
3.				
4.				
5.				
6.				
7.				
8.				
		_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)				
1.				
2.				
		_____ = Total Cover		

% Bare Ground in Herb Stratum <u>5%</u>	% Cover of Biotic Crust _____
---	-------------------------------

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____	(A) _____ (B) _____

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0¹

___ Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present?

Yes _____ No X

Remarks:

Remarks:

SOILSampling Point: CCCA SP-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-10	10YR 7/4	95%	—	—	—	—	SL	VFR+SOFT, HUMSBK
	10YR 3/2	5%	—	—	—	—		PARTING TO CRUMB
								F-Fi Gravel / COARSE SAND
								VF Mod-Fi Roots 5%
10-19	2.5Y 5/4	100%					SAND	TR FINE ROOTS, VFR
								CRUMB - HUMSBK

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

Indicators for Problematic Hydric Soils³:

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 1 cm Muck (A9) (LRR C)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> 2 cm Muck (A10) (LRR B)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> Reduced Vertic (F18)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Stratified Layers (A5) (LRR C)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> 1 cm Muck (A9) (LRR D)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Vernal Pools (F9)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)		

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

APPEARS TO BE FILL ASSOCIATED WITH POND - MIXED, SOME FINE GRAVELS

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

Secondary Indicators (2 or more required)

<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Water Marks (B1) (Riverine)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Biotic Crust (B12)	<input type="checkbox"/> Sediment Deposits (B2) (Riverine)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Drift Deposits (B3) (Riverine)
<input type="checkbox"/> Water Marks (B1) (Nonriverine)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Sediment Deposits (B2) (Nonriverine)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Drift Deposits (B3) (Nonriverine)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____Water Table Present? Yes _____ No X Depth (inches): _____Saturation Present? Yes _____ No X Depth (inches): _____
(includes capillary fringe)Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPROX 50 INCHES ABOVE POND CHAIN

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: SSFL AREA 1 City/County: VENTURA Sampling Date: 1/4/2012
 Applicant/Owner: NASA State: CA Sampling Point: SW-1 SP-1
 Investigator(s): R. HUDDLESTON, S. LONG Section, Township, Range: 02N 17W SEC 20 (SBN)
 Landform (hillslope, terrace, etc.): HILL SLOPE Local relief (concave, convex, none): CONCAVE Slope (%): 0-5%
 Subregion (LRR): C Lat: 34°14' 23.607" Long: 118°41' 07.334 Datum: NAD83
 Soil Map Unit Name: SN G SEDIMENTARY ROCK LAND NWI classification: NONE

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☒ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Wetland Hydrology Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Remarks: <u>BELOW AVE RAINFALL TO DATE - SMALL CONSTRUCTED BASIN</u>		

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u> </u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>33%</u> (A/B)
1. <u>NONE</u>				
2. <u>/</u>				
3. <u>/</u>				
4. <u>/</u>				
<u> </u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>2M</u>)				Hydrophytic Vegetation Indicators: <input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
1. <u>NONE</u>				
2. <u>/</u>				
3. <u>/</u>				
<u> </u> = Total Cover				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Herb Stratum (Plot size: <u>ENTIRE BASIN</u>)				
1. <u>ANAGALLIS ARVENSIS</u>	<u>3%</u>	<u>Y</u>	<u>FAC</u>	Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
2. <u>HYPOCHAERIS GLABRA</u>	<u>2%</u>	<u>Y</u>	<u>NL</u>	
3. <u>ERODIUM BOTRYS</u>	<u>2%</u>	<u>Y</u>	<u>NL</u>	
4. <u>BRASSICA NIGRA</u>	<u>1%</u>		<u>NL</u>	
<u>8%</u> = Total Cover				
Woody Vine Stratum (Plot size: <u> </u>)				
1. <u>NONE</u>				
2. <u>/</u>				
<u> </u> = Total Cover				
% Bare Ground in Herb Stratum <u>290</u>	% Cover of Biotic Crust <u> </u>			
Remarks: <u>SEEDLINGS ONLY THIS TIME OF YEAR</u> <u>- MOSS COVERS MUCH OF THE SOILS IN THIS AREA</u>				

SOIL

Sampling Point: SW-1 SP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-1	10YR 5/3	100	—	—	—	—	SL	FR, WMSBK, F-VF ROOTS 5%; TRACE FINE GRAVEL
1-10	10YR 6/4	60%					SAND	TRACE F: ROOTS
	10YR 4/3	40%					FSL	VFR, WMSBK - PARTS TO GRAN.
			INCLUSIONS - FR, WMSBK TR VF ROOTS					

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

Indicators for Problematic Hydric Soils³:

- ☐ Histosol (A1)
☐ Histic Epipedon (A2)
☐ Black Histic (A3)
☐ Hydrogen Sulfide (A4)
☐ Stratified Layers (A5) (LRR C)
☐ 1 cm Muck (A9) (LRR D)
☐ Depleted Below Dark Surface (A11)
☐ Thick Dark Surface (A12)
☐ Sandy Mucky Mineral (S1)
☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
☐ Stripped Matrix (S6)
☐ Loamy Mucky Mineral (F1)
☐ Loamy Gleyed Matrix (F2)
☐ Depleted Matrix (F3)
☐ Redox Dark Surface (F6)
☐ Depleted Dark Surface (F7)
☐ Redox Depressions (F8)
☐ Vernal Pools (F9)

- ☐ 1 cm Muck (A9) (LRR C)
☐ 2 cm Muck (A10) (LRR B)
☐ Reduced Vertic (F18)
☐ Red Parent Material (TF2)
☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: SANDSTONE ROCK
 Depth (inches): 6-10 INCHES

Hydric Soil Present? Yes ☐ No ☒

Remarks:

APPEARS TO BE AN EXCAVATED BASIN - SOILS BERMED ON NORTH
 SIDE - BELOW 1 INCH SOILS APPEAR MIXED
 ABRUPT TRANSITION TO SANDSTONE ROCK 6-10" BGS

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

Secondary Indicators (2 or more required)

- ☐ Surface Water (A1)
☐ High Water Table (A2)
☐ Saturation (A3)
☐ Water Marks (B1) (Nonriverine)
☐ Sediment Deposits (B2) (Nonriverine)
☐ Drift Deposits (B3) (Nonriverine)
☐ Surface Soil Cracks (B6)
☐ Inundation Visible on Aerial Imagery (B7)
☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
☐ Biotic Crust (B12)
☐ Aquatic Invertebrates (B13)
☐ Hydrogen Sulfide Odor (C1)
☐ Oxidized Rhizospheres along Living Roots (C3)
☐ Presence of Reduced Iron (C4)
☐ Recent Iron Reduction in Tilled Soils (C6)
☐ Thin Muck Surface (C7)
☐ Other (Explain in Remarks)
- ☐ Water Marks (B1) (Riverine)
☐ Sediment Deposits (B2) (Riverine)
☐ Drift Deposits (B3) (Riverine)
☐ Drainage Patterns (B10)
☐ Dry-Season Water Table (C2)
☐ Crayfish Burrows (C8)
☐ Saturation Visible on Aerial Imagery (C9)
☐ Shallow Aquitard (D3)
☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____
 Water Table Present? Yes ☐ No ☒ Depth (inches): _____
 Saturation Present? Yes ☐ No ☒ Depth (inches): _____
 (includes capillary fringe)

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

SHALLOW BASIN - NOTABLE ABSENCE OF UPLAND VEGETATION
 RELATIVE TO SURROUNDING AREAS - BUT NO EVIDENCE OF PONDING
 BELOW AVERAGE RAINFALL SO PONDING COULD NOT BE
 DEFINITELY RULED OUT IN THIS AREA.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: SSFL AREA 1 City/County: VENTURA Sampling Date: 1/4/2012
 Applicant/Owner: NASA State: CA Sampling Point: SW-1-SP-2
 Investigator(s): R. HUDDLESTON, S. LONG Section, Township, Range: 02N 17N SEC 20 (SBM)
 Landform (hillslope, terrace, etc.): HILL SLOPE Local relief (concave, convex, none): CONCAVE Slope (%): 0-5%
 Subregion (LRR): C Lat: 34° 14' 23.680" Long: 118° 41' 07.394" Datum: NAD83
 Soil Map Unit Name: SNG SEDIMENTARY ROCK LAND NWI classification: NONE

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☒
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Wetland Hydrology Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Remarks: <u>BELOW AVE RAINFALL FOR DECEMBER -</u>			

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u> </u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:	
1. <u>NONE</u>				Number of Dominant Species That Are OBL, FACW, or FAC:	<u>0</u> (A)
2. <u>/</u>				Total Number of Dominant Species Across All Strata:	<u>3</u> (B)
3. <u>/</u>				Percent of Dominant Species That Are OBL, FACW, or FAC:	<u>0%</u> (A/B)
4. <u>/</u>					
= Total Cover					
Sapling/Shrub Stratum (Plot size: <u>2m</u>)				Prevalence Index worksheet:	
1. <u>ARTEMESIA CALIFORNICA</u>	<u>10%</u>	<u>Y</u>	<u>NL</u>	Total % Cover of:	Multiply by:
2. <u>ADENOSTOMA FASCICULATA</u>	<u>5%</u>	<u>Y</u>	<u>NL</u>	OBL species <u> </u>	x 1 = <u> </u>
3. <u> </u>				FACW species <u> </u>	x 2 = <u> </u>
4. <u> </u>				FAC species <u> </u>	x 3 = <u> </u>
5. <u> </u>				FACU species <u> </u>	x 4 = <u> </u>
= Total Cover				UPL species <u> </u>	x 5 = <u> </u>
Herb Stratum (Plot size: <u>2m</u>)				Column Totals:	(A) <u> </u> (B) <u> </u>
1. <u>Avena BARBATA</u>	<u>15%</u>	<u>Y</u>	<u>NL</u>	Prevalence Index = B/A = <u> </u>	
2. <u>ERODIUM BOTRYS</u>	<u>2%</u>		<u>NL</u>	Hydrophytic Vegetation Indicators:	
3. <u>BRASSICA NIGRA</u>	<u>2%</u>		<u>NL</u>	<input type="checkbox"/> Dominance Test is >50%	
4. <u>POA SP. (CL SECUNDA)</u>	<u>2%</u>		<u>NL</u>	<input type="checkbox"/> Prevalence Index is ≤3.0 ¹	
5. <u>CRYPTANTHIA SP</u>	<u>1%</u>		<u>NL</u>	<input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)	
6. <u> </u>				<input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)	
7. <u> </u>					
8. <u> </u>					
<u>~22%</u> = Total Cover				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	
Woody Vine Stratum (Plot size: <u> </u>)				Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
1. <u> </u>					
2. <u> </u>					
= Total Cover					
% Bare Ground in Herb Stratum <u>780%</u>	% Cover of Biotic Crust <u> </u>				

Remarks:

ARFA-1

SOIL

Sampling Point: SW-1 SP-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-11	10YR 4/3	100	—	—	—	—	LFS	VF-LOOSE, VW MSBK PARTS TO GRAN. F-Fi ROOTS <5%
11-19	10YR 4/3	100	—	—	—	—	LFS	FR -NO ROOTS MM ABK

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

Indicators for Problematic Hydric Soils³:

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 1 cm Muck (A9) (LRR C)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> 2 cm Muck (A10) (LRR B)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> Reduced Vertic (F18)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Stratified Layers (A5) (LRR C)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> 1 cm Muck (A9) (LRR D)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Vernal Pools (F9)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)		

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: NONE ENCOUNTERED

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

Secondary Indicators (2 or more required)

<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Water Marks (B1) (Riverine)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Biotic Crust (B12)	<input type="checkbox"/> Sediment Deposits (B2) (Riverine)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Drift Deposits (B3) (Riverine)
<input type="checkbox"/> Water Marks (B1) (Nonriverine)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Sediment Deposits (B2) (Nonriverine)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Drift Deposits (B3) (Nonriverine)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____Water Table Present? Yes _____ No X Depth (inches): _____Saturation Present? Yes _____ No X Depth (inches): _____
(includes capillary fringe)Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: NASA SSFL AREA I City/County: VENTURA CO. Sampling Date: 1/4/2012
 Applicant/Owner: NASA State: CA Sampling Point: SW-2 SP-3
 Investigator(s): P. HUDDLESTON, S. LONG Section, Township, Range: 02N 17W SEC20 (SBM)
 Landform (hillslope, terrace, etc.): HILL SLOPE Local relief (concave, convex, none): CONCAVE Slope (%): 5%
 Subregion (LRR): C Lat: 34°14' 20.658 Long: -118° 41' 20.649 Datum: NAD 83
 Soil Map Unit Name: SUG SEDIMENTARY ROCK LAND NWI classification: PABHx

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Remarks: <u>BELOW AVE RAINFALL FOR THIS TIME OF YEAR</u> <u>CONSTRUCTED IMPOUNDMENT</u>		

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
1. _____				
2. _____				
3. _____				
4. _____				
= Total Cover				
Sapling/Shrub Stratum (Plot size: _____)				
1. _____				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
2. _____				
3. _____				
4. _____				
5. _____				
= Total Cover				
Herb Stratum (Plot size: <u>1m²</u>)				
1. <u>POLYPOGON MONSPELIENSIS</u>	<u>10%</u>	<u>Y</u>	<u>FACU+</u>	Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>CYPERUS ERAGROSTIS</u>	<u>1%</u>		<u>FACW</u>	
3. <u>ANAGALIS ARVENSIS</u>	<u>1%</u>		<u>FAC</u>	
4. <u>ELEOCHARIS MACROSTACHYA</u>	<u>1%</u>		<u>OBL</u>	
5. _____				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
6. _____				
7. _____				
8. _____				
= Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
2. _____				
= Total Cover				
% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____				
Remarks: <u>SEEDLINGS ONLY AT THIS TIME OF YEAR</u> <u>VEGETATION GRAZED (HORSES)</u>				

SOIL

Sampling Point: SW-2 SP-3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	10YR 4/2	100	-	-	-	-	FSL	FR, WMSBK, M-F ROOTS 20%
2-9	10YR 3/1	90%	5YR 5/6	22%	C	M	LFS	MMSBK, FR, TR VF ROOTS
	10YR 5/3	10%					SAND	ON PED SURFACES
9-16	10YR 3/1	98%	5YR 5/6	22%	C	M	LFS	MMSBK, FR
	10YR 5/3	2%					SAND	ON PED SURFACES
16-19	10YR 4/3	100%	-	-	-	-	SAND	LOOSE, MMS, NO ROOTS

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> 1 cm Muck (A9) (LRR C)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> 2 cm Muck (A10) (LRR B)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Reduced Vertic (F18)
<input type="checkbox"/> Stratified Layers (A5) (LRR C)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> 1 cm Muck (A9) (LRR D)	<input type="checkbox"/> Redox Dark Surface (F6)	<input checked="" type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Vernal Pools (F9)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)		

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: None Encountered

Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐

Remarks: 2-9" SAND ALONG PED SURFACES - SOME REDOX BUT LESS THAN 2% - SOILS CLEARLY INUNDATED BASED ON POSITION IN BASIN AND EVIDENCE OF ORDINARY HIGH WATER

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Biotic Crust (B12)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)
<input checked="" type="checkbox"/> Water Marks (B1) (Nonriverine)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)
<input type="checkbox"/> Sediment Deposits (B2) (Nonriverine)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input checked="" type="checkbox"/> Drift Deposits (B3) (Nonriverine)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Thin Muck Surface (C7)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Other (Explain in Remarks)
	<input type="checkbox"/> Water Marks (B1) (Riverine)
	<input type="checkbox"/> Sediment Deposits (B2) (Riverine)
	<input type="checkbox"/> Drift Deposits (B3) (Riverine)
	<input type="checkbox"/> Drainage Patterns (B10)
	<input type="checkbox"/> Dry-Season Water Table (C2)
	<input type="checkbox"/> Crayfish Burrows (C8)
	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
	<input type="checkbox"/> Shallow Aquitard (D3)
	<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☒ No ☐ Depth (inches): 212"

Water Table Present? Yes ☒ No ☐ Depth (inches): 18"

Saturation Present? Yes ☐ No ☐ Depth (inches): _____

(includes capillary fringe)

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: SURFACE WATER NOT OBSERVED AT SAMPLE POINT - BUT POINT IS WITHIN POND OUTHW - IMPOUNDMENT POND

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: SSFL AREA I City/County: VENTURA CO. Sampling Date: 1/4/2012
 Applicant/Owner: NASA State: CA. Sampling Point: SW-2 SP-4
 Investigator(s): R. HUPPINGTON, S. LONG Section, Township, Range: 02N 17W SEC 20 (SBM)
 Landform (hillslope, terrace, etc.): HILL SLOPE Local relief (concave, convex, none): NONE Slope (%): 5%
 Subregion (LRR): C Lat: 34°14' 20.777 Long: 118° 41' 20.857 Datum: NAD 84
 Soil Map Unit Name: SUB SEDIMENTARY ROCK LAND NWI classification: PSSB

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Wetland Hydrology Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Remarks: <u>BELOW AVE RAINFALL FOR THIS TIME OF YEAR</u>			

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:	
1. _____				Number of Dominant Species That Are OBL, FACW, or FAC:	<u>0</u> (A)
2. _____				Total Number of Dominant Species Across All Strata:	<u>2</u> (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC:	<u>0%</u> (A/B)
4. _____					
				= Total Cover	
Sapling/Shrub Stratum (Plot size: <u>2m²</u>)				Prevalence Index worksheet:	
1. <u>MALOSOMA LAURINA</u>	<u>30%</u>	<u>Y</u>	<u>NL</u>	Total % Cover of:	Multiply by:
2. _____				OBL species	x 1 = _____
3. _____				FACW species	x 2 = _____
4. _____				FAC species	x 3 = _____
5. _____				FACU species	x 4 = _____
				UPL species	x 5 = _____
				Column Totals:	(A) _____ (B) _____
				Prevalence Index = B/A = _____	
Herb Stratum (Plot size: <u>1m²</u>)				Hydrophytic Vegetation Indicators:	
1. <u>POA (CF) SECURDA</u>	<u>40%</u>		<u>NL</u>	___ Dominance Test is >50%	
2. <u>Rumex sp.</u>	<u>1%</u>		<u>FACW</u>	___ Prevalence Index is ≤3.0 ¹	
3. <u>Anagallis arvensis</u>	<u>TR</u>		<u>FAC</u>	___ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)	
4. _____				___ Problematic Hydrophytic Vegetation ¹ (Explain)	
5. _____					
6. _____					
7. _____					
8. _____					
				= Total Cover	
Woody Vine Stratum (Plot size: _____)				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	
1. _____				Hydrophytic Vegetation Present?	
2. _____				Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
				= Total Cover	
% Bare Ground in Herb Stratum <u>460</u>	% Cover of Biotic Crust _____				
Remarks:					

SOIL

Sampling Point: SW-2 SP-4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-1	10YR 9/2	100%	—	—	—	—	FSL	FR WM ABK, F-M ROOTS 5%
1-6	10YR 4/2	70%	10YR 5/6	30%	C	M	FSL	FR WM SBK, VFI-FI ROOTS 1%
6-17	10YR 4/3	70%	10YR 5/1	5%	C	M	LFS	FR, WM SBK
			10YR 4/6	25%	C	M		

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

Indicators for Problematic Hydric Soils³:

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 1 cm Muck (A9) (LRR C)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> 2 cm Muck (A10) (LRR B)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> Reduced Vertic (F18)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Stratified Layers (A5) (LRR C)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> 1 cm Muck (A9) (LRR D)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Vernal Pools (F9)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)		

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: NE

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

- SOILS POSSIBLY EXCAVATED TO ENHANCE / ENLARGE
NATURAL POND - SAMPLE POINT ABOVE OHMUM
w/ NO ABUNDANT HYDROPHYTIC VEGETATION PRESENT

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

Secondary Indicators (2 or more required)

<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Water Marks (B1) (Riverine)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Biotic Crust (B12)	<input type="checkbox"/> Sediment Deposits (B2) (Riverine)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Drift Deposits (B3) (Riverine)
<input type="checkbox"/> Water Marks (B1) (Nonriverine)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Sediment Deposits (B2) (Nonriverine)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Drift Deposits (B3) (Nonriverine)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____Water Table Present? Yes _____ No X Depth (inches): _____Saturation Present? Yes _____ No X Depth (inches): _____
(includes capillary fringe)Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

ABOVE POND OHMUM

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: SSFL R-2A Pond City/County: VENTURA Sampling Date: 1/5/2012
 Applicant/Owner: NASA State: CA Sampling Point: R2A-SP-1
 Investigator(s): R. HADDLESTON, S. LONG Section, Township, Range: 02N 17W SEC 30 (SBM)
 Landform (hillslope, terrace, etc.): TERRACE Local relief (concave, convex, none): CONCAVE Slope (%): 0-5%
 Subregion (LRR): C Lat: 34° 13' 35.861" Long: -118° 42' 19.440 Datum: NAD83
 Soil Map Unit Name: SUG SEDIMENTARY ROCK LAND NWI classification: _____
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No X (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No _____
 Hydric Soil Present? Yes _____ No _____
 Wetland Hydrology Present? Yes _____ No _____

Is the Sampled Area

within a Wetland? Yes _____ No _____

Remarks: BELOW AVE RAINFALL TO DATE - HIGHLY MANAGED HYDROLOGY IN CONSTRUCTED POND

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>2</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
4. _____	_____	_____	_____	
_____ = Total Cover				
Shrub/Straw Stratum (Plot size: <u>2m²</u>)				Prevalence Index worksheet:
1. <u>BACCHARIS SALICIFOLIA</u>	<u>5%</u>	<u>Y</u>	<u>FACW</u>	Total % Cover of: _____ Multiply by: _____
2. _____	_____	_____	_____	OBL species _____ x 1 = _____
3. _____	_____	_____	_____	FACW species _____ x 2 = _____
4. _____	_____	_____	_____	FAC species _____ x 3 = _____
5. _____	_____	_____	_____	FACU species _____ x 4 = _____
_____ = Total Cover				UPL species _____ x 5 = _____
Herb Stratum (Plot size: <u>1m²</u>)				Column Totals: _____ (A) _____ (B)
1. <u>CYPERUS ERAGROSTIS</u>	<u>5%</u>	<u>Y</u>	<u>FACW</u>	Prevalence Index = B/A = _____
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover				
Woody/Vine Stratum (Plot size: _____)				Hydrophytic Vegetation Indicators:
1. _____	_____	_____	_____	<u>X</u> Dominance Test is >50%
2. _____	_____	_____	_____	Prevalence Index is ≤3.0 ¹
_____ = Total Cover				Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
				Problematic Hydrophytic Vegetation ¹ (Explain)
% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
				Hydrophytic Vegetation Present? Yes <u>X</u> No _____

Remarks: EXTENSIVE DEAD STEMS OF SCIRPUS THROUGHOUT THIS AREA - NO LIVE TULE OR LIVE ROOTS / RHIZOMES EVIDENT

SOIL

Sampling Point: RZA-SP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2"	10YR 3/2	100%	—	—	—	—	Gi	FINELY LAYERED ORGANIC MATERIAL w/ FINE SAND / SILT
2-6"	10YR 3/2	60%	—	—	—	—	LFS	MIXED SAND, LOOSE
	10YR 5/4	40%	—	—	—	—	LFS	MASSIVE
6-19"	10YR 3/2	90%	10YR 2/1	2%	C	M	FSL	MMSBK, FR
			10YR 4/4	8%	C	P/RL		

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Linings, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 1 cm Muck (A9) (LRR C)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> 2 cm Muck (A10) (LRR B)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> Reduced Vertic (F18)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Stratified Layers (A5) (LRR C)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> 1 cm Muck (A9) (LRR D)	<input checked="" type="checkbox"/> Redox Dark Surface (F6)		
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Vernal Pools (F9)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)			

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present): Type: <u>PORE</u> Depth (inches): <u>7.9"</u>	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
--	--

Remarks: - REDOX DARK SURFACE 6" THICK WITHIN UPPER 12 INCHES WITH 8% DISTINCT CONCENTRATIONS ALONG ROOT CHANNELS ON PORE LININGS

HYDROLOGY

Wetland Hydrology Indicators:		
Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Water Marks (B1) (Riverine)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Biotic Crust (B12)	<input type="checkbox"/> Sediment Deposits (B2) (Riverine)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Drift Deposits (B3) (Riverine)
<input checked="" type="checkbox"/> Water Marks (B1) (Nonriverine)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Sediment Deposits (B2) (Nonriverine)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Drift Deposits (B3) (Nonriverine)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: AREA WAS DRY AT TIME OF SURVEY - NO INDICATION OF RECENT PONDING, BUT SAMPLE LOCATION IS WITHIN THE PAST EXTENT OF CHUM - HYDROLOGY NOW MANAGED BY PUMPING FROM THE POND

SOIL

Sampling Point: R2A-SP-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features		Type ¹	Loc ²	Texture	Remarks
	Color (moist)	%	Color (moist)	%				
0-2	10YR 3/2	100%					LFS	VW-FINE SBK → GRAP.
								VFR-SO 20% FINE ROOTS
2-14"	10YR 4/1	70%	MIXED				LFS	INT SBK. VFR, COARSE
	10YR 4/4	30%						TO VF ROOTS 5%
14-24	10YR 4/3	100%					LFS	MASSIVE, GRAP
								1% F-T ROOTS

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 1 cm Muck (A9) (LRR C)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> 2 cm Muck (A10) (LRR B)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> Reduced Vertic (F18)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Stratified Layers (A5) (LRR C)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> 1 cm Muck (A9) (LRR D)	<input type="checkbox"/> Redox Dark Surface (F6)		
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Vernal Pools (F9)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)			

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present): Type: <u>NE</u> Depth (inches): <u>224"</u>	Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
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Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		
Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Water Marks (B1) (Riverine)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Biotic Crust (B12)	<input type="checkbox"/> Sediment Deposits (B2) (Riverine)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Drift Deposits (B3) (Riverine)
<input type="checkbox"/> Water Marks (B1) (Nonriverine)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Sediment Deposits (B2) (Nonriverine)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Drift Deposits (B3) (Nonriverine)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:		Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____ (includes capillary fringe)	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: ABOVE CHM MARK OF TMD - NO EVIDENCE OF WETLAND HYDROLOGY

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: SSFL - R2B POND City/County: VENTURA Sampling Date: 1/5/2012
 Applicant/Owner: NASA State: CA Sampling Point: R2B-SF-1
 Investigator(s): R. HUDDLESTON, S. LONG Section, Township, Range: 02N 17W SEC 30 (SBM)
 Landform (hillslope, terrace, etc.): TERRACE Local relief (concave, convex, none): CONCAVE Slope (%): 0-5%
 Subregion (LRR): C Lat: 34°13' 35.770" Long: 118°42' 25.129" Datum: NAD83 1984
 Soil Map Unit Name: SUG - SEDIMENTARY ROCK LAND NWI classification: NONE
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No
 Hydric Soil Present? Yes X No
 Wetland Hydrology Present? Yes X No

Is the Sampled Area
within a Wetland? Yes X No

Remarks: BELOW AVE RAINFALL TO DATE - CONSTRUCTED IMPOUNDMENT POND

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)
 1. Absolute % Cover Dominant Species? Indicator Status
 2.
 3.
 4.

Sapling/Shrub Stratum (Plot size: 2m²)
 1. SALIX LASIOLEPIS 20% Y FACW
 2. BACCHARIS SALICIFOLIA 20% Y FACW
 3.
 4.
 5.

Herb Stratum (Plot size:)
 1. BRASSICA NIGRA 2% Y NL
 2.
 3.
 4.
 5.
 6.
 7.
 8.

Woody Vine Stratum (Plot size:)
 1.
 2.
 3.
 4.
 5.
 6.
 7.
 8.

(Leaf litter) 95% = Total Cover
 % Bare Ground in Herb Stratum % Cover of Biotic Crust

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
 Total Number of Dominant Species Across All Strata: 3 (B)
 Percent of Dominant Species That Are OBL, FACW, or FAC: 66% (A/B)

Prevalence Index worksheet:

Total % Cover of: Multiply by:
 OBL species x 1 =
 FACW species x 2 =
 FAC species x 3 =
 FACU species x 4 =
 UPL species x 5 =
 Column Totals: (A) (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%
 Prevalence Index is ≤3.0¹
 Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic
Vegetation
Present?

Yes X No

Remarks: SPARSE BRASSICA COMING INTO THE EDGES - BUT LOW WATER LEVEL IN POND AT TIME OF SURVEY
REMNANT/DEAD TYPHA / SCIRPUS - BUT NO LIVE ROOTS/RHIZOMES

SOIL

Sampling Point: R2B-SP-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-6"	10YR4/2	100%	—	—	—	—	LFS	WMSBK, VER, 5% ROOTS VF-M
6-18"	10YR4/2	100%	—	—	—	—	LFS	CM3BK, FR TRACE VF ROOTS

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

Indicators for Problematic Hydric Soils³:

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 1 cm Muck (A9) (LRR C)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> 2 cm Muck (A10) (LRR B)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> Reduced Vertic (F18)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Stratified Layers (A5) (LRR C)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> 1 cm Muck (A9) (LRR D)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Vernal Pools (F9)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)		

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: SANDSTONEDepth (inches): 18"Hydric Soil Present? Yes ☐ No ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

Secondary Indicators (2 or more required)

<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Water Marks (B1) (Riverine)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Biotic Crust (B12)	<input type="checkbox"/> Sediment Deposits (B2) (Riverine)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Drift Deposits (B3) (Riverine)
<input type="checkbox"/> Water Marks (B1) (Nonriverine)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Sediment Deposits (B2) (Nonriverine)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Drift Deposits (B3) (Nonriverine)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____Water Table Present? Yes ☐ No ☒ Depth (inches): _____Saturation Present? Yes ☐ No ☒ Depth (inches): _____

(includes capillary fringe)

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

SAMPLE POINT ABOVE OHW OF POND

Appendix F Stream Data Sheets

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ARID REGIONS - WETLAND DELINEATION DATA SHEET

Project: NASA - Santa Susana Field LabDate: 1/4/2012Observers: Russell Huddleston and Steve LongFeature Name NORTHERN DRAINAGE Sample Point ND-1GPS Location: 34° 14' 12.275" 118° 41' 06.777"

Geomorphic Feature

<input type="checkbox"/> River	<input type="checkbox"/> Lake	<input type="checkbox"/> Swale
<input checked="" type="checkbox"/> Stream	<input type="checkbox"/> Pond	<input type="checkbox"/> Erosional Channel
<input type="checkbox"/> Canal	<input type="checkbox"/> Impoundment	<input type="checkbox"/> Gully
<input type="checkbox"/> Irrigation Channel	<input type="checkbox"/> Playa	<input type="checkbox"/> Depressional Basin
<input type="checkbox"/> Drainage Channel	<input type="checkbox"/> Constructed Basin	<input type="checkbox"/> Rock Basin
<input type="checkbox"/> Excavated Ditch	<input type="checkbox"/> Unvegetated Depression	<input type="checkbox"/> Other: _____

Apparent Hydrologic Regime

<input type="checkbox"/> Perennial	<input type="checkbox"/> Standing Water (Depth: _____)
<input checked="" type="checkbox"/> Intermittent	<input type="checkbox"/> Flowing Water (Depth: _____)
<input type="checkbox"/> Ephemeral	<input checked="" type="checkbox"/> Dry at time of the survey

Indicators

<input type="checkbox"/> Standing or flowing water with no indication of recent precipitation	<input type="checkbox"/> Channel adjacent to shelf with steep side	<input type="checkbox"/> Natural / irrigation / manmade / ditch flowing into feature
<input type="checkbox"/> presence of hydrophytic vegetation	<input type="checkbox"/> Natural line, stain or mineral (salt) deposit	<input type="checkbox"/> Dated picture / account showing / referring to identifiable features
<input type="checkbox"/> Presence of hydric soil with or without hydrophytic vegetation	<input checked="" type="checkbox"/> Litter, debris and or clay deposits	<input checked="" type="checkbox"/> Wetland symbol on map (presence of solid or dotted blue line, solid, shaded or stippled blue area on map)
<input checked="" type="checkbox"/> Absence of vegetation or interruption of upland vegetation	<input type="checkbox"/> Algae or alga mat	<input type="checkbox"/> Other (Specify)

Notes: - BLUE LINE ON USGS TOPO - CALABASAS QUAD
- MID INT. STREAM
- NW1 - PSSA

- DRIFT / DEBRIS PRESENT 28" ABOVE THE CHANNEL BED IN SOME AREAS

Channel Characteristics

Channel Width	7.3 FT	
Channel Depth	> 3 FT DEEPLY INCISED CHANNEL	
Low Flow Width	6 FT	
Low Flow Depth	2.3 FT	
Channel Substrate (check all that apply)		
<input checked="" type="checkbox"/> Sand	<input checked="" type="checkbox"/> Cobble	<input type="checkbox"/> Silt / Clay
<input checked="" type="checkbox"/> Gravel	<input checked="" type="checkbox"/> Rock	<input type="checkbox"/> Other _____
ROCKY SUBSTRATE w/ SAND AND GRAVEL SOME SANDSTONE BOULDERS		

Vegetation Characteristics of Channel or Basin

Vegetated Channel or Basin?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Dominant / Characteristic Species		

Vegetation Adjacent to Channel

Dominant / Characteristic Species
HETERMELES ARBUTIFOLIA, SAMBUCUS NIGRA,
QUERCUS AGRIFOLIA, CRANOTITUS CRASSIFOLIUS,
LONICERA SUBSPICATA, ERIODICTYON CRASSIFOLIUM,
PHACELIA RAMOSISSIMA, CARDUUS PYNOCEPHALUS,
PIPTATHERUM MILIACEUM, RIBES MALVACEUM,
ARTEMESIA CALIFORNICA

Notes: EAST END OF AREA 1 - DEEPLY INCISED CHANNEL OVER 8 FEET STEEP BANKS.

ARID REGIONS - WETLAND DELINEATION DATA SHEET

Project: NASA - Santa Susana Field LabDate: 1/4/2012Observers: Russell Huddleston and Steve LongFeature Name NORTHERN DRAINAGE Sample Point ND-2GPS Location: 34° 14' 11.926" 118° 41' 07.789"

Geomorphic Feature

<input type="checkbox"/> River	<input type="checkbox"/> Lake	<input type="checkbox"/> Swale
<input checked="" type="checkbox"/> Stream	<input type="checkbox"/> Pond	<input type="checkbox"/> Erosional Channel
<input type="checkbox"/> Canal	<input type="checkbox"/> Impoundment	<input type="checkbox"/> Gully
<input type="checkbox"/> Irrigation Channel	<input type="checkbox"/> Playa	<input type="checkbox"/> Depressional Basin
<input type="checkbox"/> Drainage Channel	<input type="checkbox"/> Constructed Basin	<input type="checkbox"/> Rock Basin
<input type="checkbox"/> Excavated Ditch	<input type="checkbox"/> Unvegetated Depression	<input type="checkbox"/> Other: _____

Apparent Hydrologic Regime

<input type="checkbox"/> Perennial	<input type="checkbox"/> Standing Water (Depth: _____)
<input checked="" type="checkbox"/> Intermittent	<input type="checkbox"/> Flowing Water (Depth: _____)
<input type="checkbox"/> Ephemeral	<input checked="" type="checkbox"/> Dry at time of the survey

Indicators

<input type="checkbox"/> Standing or flowing water with no indication of recent precipitation	<input type="checkbox"/> Channel adjacent to shelf with steep side	<input type="checkbox"/> Natural / irrigation / manmade / ditch flowing into feature
<input type="checkbox"/> presence of hydrophytic vegetation	<input type="checkbox"/> Natural line, stain or mineral (salt) deposit	<input type="checkbox"/> Dated picture / account showing / referring to identifiable features
<input type="checkbox"/> Presence of hydric soil with or without hydrophytic vegetation	<input checked="" type="checkbox"/> Litter, debris and or clay deposits	<input checked="" type="checkbox"/> Wetland symbol on map (presence of solid or dotted blue line, solid, shaded or stippled blue area on map)
<input checked="" type="checkbox"/> Absence of vegetation or interruption of upland vegetation	<input type="checkbox"/> Algae or alga mat	<input type="checkbox"/> Other (Specify)

Notes:

- BLUE LINE ON USGS CALABASAS QUAD
- NITD INT. STREAM
- NW1 - PSSA
- DRIFT / DEBRIS ON ROCKS WITHIN CHANNEL

Channel Characteristics

Channel Width	9 FT
Channel Depth	1-2 FT
Low Flow Width	5 FT
Low Flow Depth	6 INCHES
Channel Substrate (check all that apply)	
<input checked="" type="checkbox"/> Sand	<input checked="" type="checkbox"/> Cobble
<input checked="" type="checkbox"/> Gravel	<input checked="" type="checkbox"/> Rock
<input type="checkbox"/> Silt / Clay	
<input type="checkbox"/> Other _____	
ROCKY - BOULDER / COBBLE w/ SOME SAND / GRAVEL	

Vegetation Characteristics of Channel or Basin

Vegetated Channel or Basin?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	TOTAL < 5% COVER
Dominant / Characteristic Species			
CARDUUS PYNOCEPHALUS			
POLYPOGON MONSPELIENSIS			
RUMEX CRISPUS			

Vegetation Adjacent to Channel

Dominant / Characteristic Species
TOXICODENDRON DIVERSILOBUM, SALIX LASIOLEPIS,
(ONE WILLOW ~ 4-5" DBH)
PHACELIA RAMOSISSIMA, CARDUUS PYNOCEPHALUS,
PIPTATHERUM MILIACEUM
QUERCUS AGRIFOLIA - UPPER BANK ALONG S. SLOPE

Notes:

LARGE, DEEPLY INCISED CHANNEL - SOME AREAS BANKS OVER 8 FEET TALL - WATER FLOW 1-2 FEET ONLY

-SCATTERED QUERCUS AGRIFOLIA ALONG SOUTH SLOPE - WELL ABOVE ACTIVE FLOW CHANNEL

ARID REGIONS - WETLAND DELINEATION DATA SHEET

Project: NASA - Santa Susana Field LabDate: 1/4/2012Observers: Russell Huddleston and Steve LongFeature Name NORTHERN DRAINAGE Sample Point ND-3GPS Location: 34° 14' 11.651" 118° 41' 11.688"

Geomorphic Feature

<input type="checkbox"/> River	<input type="checkbox"/> Lake	<input type="checkbox"/> Swale
<input checked="" type="checkbox"/> Stream	<input type="checkbox"/> Pond	<input type="checkbox"/> Erosional Channel
<input type="checkbox"/> Canal	<input type="checkbox"/> Impoundment	<input type="checkbox"/> Gully
<input type="checkbox"/> Irrigation Channel	<input type="checkbox"/> Playa	<input type="checkbox"/> Depressional Basin
<input type="checkbox"/> Drainage Channel	<input type="checkbox"/> Constructed Basin	<input type="checkbox"/> Rock Basin
<input type="checkbox"/> Excavated Ditch	<input type="checkbox"/> Unvegetated Depression	<input type="checkbox"/> Other: _____

Apparent Hydrologic Regime

<input type="checkbox"/> Perennial	<input type="checkbox"/> Standing Water (Depth: _____)
<input checked="" type="checkbox"/> Intermittent	<input type="checkbox"/> Flowing Water (Depth: _____)
<input type="checkbox"/> Ephemeral	<input checked="" type="checkbox"/> Dry at time of the survey

Indicators

<input type="checkbox"/> Standing or flowing water with no indication of recent precipitation	<input type="checkbox"/> Channel adjacent to shelf with steep side	<input type="checkbox"/> Natural / irrigation / manmade / ditch flowing into feature
<input type="checkbox"/> presence of hydrophytic vegetation	<input type="checkbox"/> Natural line, stain or mineral (salt) deposit	<input type="checkbox"/> Dated picture / account showing / referring to identifiable features
<input type="checkbox"/> Presence of hydric soil with or without hydrophytic vegetation	<input checked="" type="checkbox"/> Litter, debris and or clay deposits	<input checked="" type="checkbox"/> Wetland symbol on map (presence of solid or dotted blue line, solid, shaded or stippled blue area on map)
<input checked="" type="checkbox"/> Absence of vegetation or interruption of upland vegetation	<input type="checkbox"/> Algae or alga mat	<input type="checkbox"/> Other (Specify)

Notes: • BLUE LINE STREAM USGS CALBASAS QUAD
• NITD INT STREAM
• NWI - PSSA
- SPARSE LITTER / DEBRIS DEPOSITS

Channel Characteristics

Channel Width	8 FT	
Channel Depth	1 FT	
Low Flow Width	5.5 FT	
Low Flow Depth	4.6 INCHES	
Channel Substrate (check all that apply)		
<input checked="" type="checkbox"/> Sand	<input type="checkbox"/> Cobble	<input type="checkbox"/> Silt / Clay
<input checked="" type="checkbox"/> Gravel	<input type="checkbox"/> Rock	<input type="checkbox"/> Other _____
SAND / GRAVEL SUBSTRATE		

Vegetation Characteristics of Channel or Basin

Vegetated Channel or Basin?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Dominant / Characteristic Species		

Vegetation Adjacent to Channel

Dominant / Characteristic Species
QUERCUS AGRIFOLIA - SCATTERED ALONG TOP OF CHANNEL BANKS
ERIODICTYON CRASSIFOLIUM, PHACELIA RAMOSISSIMA, BACCHARIS PILULARIS, CARDUUS PTEROCEPHALUS, PIPTATHERUM MILALEUM, TOXICODENDRON DIVERSILOBUM
Notes: BRASSICA NIGRA

WEAKLY EXPRESSED SAND-GRAVEL CHANNEL WITHIN DEEPLY INCISED CHANNEL

-CHANNEL FLOWS DS INTO 46" DIAM CULVERT THAT IS ~80% FILLED WITH SEDIMENT NO EVIDENCE OF PONDING BEHIND CULVERT

ARID REGIONS - WETLAND DELINEATION DATA SHEET

Project: NASA - Santa Susana Field Lab Date: 11/4/2012Observers: Russell Huddleston and Steve LongFeature Name NORTHERN DRAINAGE Sample Point ND-4GPS Location: 34° 14' 11.562" 118° 41' 14.209"

Geomorphic Feature

<input type="checkbox"/> River	<input type="checkbox"/> Lake	<input type="checkbox"/> Swale
<input checked="" type="checkbox"/> Stream	<input type="checkbox"/> Pond	<input type="checkbox"/> Erosional Channel
<input type="checkbox"/> Canal	<input type="checkbox"/> Impoundment	<input type="checkbox"/> Gully
<input type="checkbox"/> Irrigation Channel	<input type="checkbox"/> Playa	<input type="checkbox"/> Depressional Basin
<input type="checkbox"/> Drainage Channel	<input type="checkbox"/> Constructed Basin	<input type="checkbox"/> Rock Basin
<input type="checkbox"/> Excavated Ditch	<input type="checkbox"/> Unvegetated Depression	<input type="checkbox"/> Other: _____

Apparent Hydrologic Regime

<input type="checkbox"/> Perennial	<input type="checkbox"/> Standing Water (Depth: _____)
<input checked="" type="checkbox"/> Intermittent	<input type="checkbox"/> Flowing Water (Depth: _____)
<input type="checkbox"/> Ephemeral	<input checked="" type="checkbox"/> Dry at time of the survey

Indicators

<input type="checkbox"/> Standing or flowing water with no indication of recent precipitation	<input type="checkbox"/> Channel adjacent to shelf with steep side	<input type="checkbox"/> Natural / irrigation / manmade / ditch flowing into feature
<input type="checkbox"/> presence of hydrophytic vegetation	<input checked="" type="checkbox"/> Natural line, stain or mineral (salt) deposit	<input type="checkbox"/> Dated picture / account showing / referring to identifiable features
<input type="checkbox"/> Presence of hydric soil with or without hydrophytic vegetation	<input checked="" type="checkbox"/> Litter, debris and or clay deposits	<input checked="" type="checkbox"/> Wetland symbol on map (presence of solid or dotted blue line, solid, shaded or stippled blue area on map)
<input type="checkbox"/> Absence of vegetation or interruption of upland vegetation	<input type="checkbox"/> Algae or alga mat	<input type="checkbox"/> Other (Specify)

Notes:

- BLUE LINE STREAM ON USGS CALABASAS QUAD
- NHD INT. STREAM
- NWI - PSSA
- SPARSE LITTER / DEBRIS DEPOSITS
- WATER STAINING ON DOWNSTREAM CULVERT

Channel Characteristics

Channel Width	8 FT		
Channel Depth	1 FT		
Low Flow Width	3.5 FT		
Low Flow Depth	6 INCHES		
Channel Substrate (check all that apply)			
<input checked="" type="checkbox"/> Sand	<input checked="" type="checkbox"/> Cobble	<input type="checkbox"/> Silt / Clay	
<input checked="" type="checkbox"/> Gravel	<input checked="" type="checkbox"/> Rock	<input type="checkbox"/> Other _____	
MOSTLY SAND / GRAVEL W/ SOME COBBLE, SANDSTONE ROCK			

Vegetation Characteristics of Channel or Basin

Vegetated Channel or Basin?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	< 5% TOTAL COVER
Dominant / Characteristic Species		SEEDLINGS	
BRASSICA NIGRA			
CARDUUS PYCNOCEPHALUS			

Vegetation Adjacent to Channel

Dominant / Characteristic Species
QUERCUS AGRIFOIA AND HETEROMELES ARBUTIFOLIA
ALONG UPPER EDGES OF THE CHANNEL
ADENOSTOMA FASCICULATUM, BRASSICA NIGRA,
GALIUM SP, CARDUUS PYCNOCEPHALUS
PIPTATHERUM MILACEUM

Notes:

CHANNEL FLOWS WEST INTO 52 INCH DIAM
CMP UNDER ROAD - WATER STAINING ON
CULVERT 32 INCHES WIDE, 6 INCHES DEEP

- SMALL TRIBUTARY EROSIONAL CHANNEL
SOUTH OF THIS POINT - CHANNEL 12-16 INCHES
WIDE, LESS THAN 12 INCHES DEEP

ARID REGIONS - WETLAND DELINEATION DATA SHEET

Project: NASA - Santa Susana Field LabDate: 1/4/2012Observers: Russell Huddleston and Steve LongFeature Name NORTHERN DRAINAGE Sample Point ND-5GPS Location: 34° 14' 12.741" 118° 41' 17.018"

Geomorphic Feature

<input type="checkbox"/> River	<input type="checkbox"/> Lake	<input type="checkbox"/> Swale
<input checked="" type="checkbox"/> Stream	<input type="checkbox"/> Pond	<input type="checkbox"/> Erosional Channel
<input type="checkbox"/> Canal	<input type="checkbox"/> Impoundment	<input type="checkbox"/> Gully
<input type="checkbox"/> Irrigation Channel	<input type="checkbox"/> Playa	<input type="checkbox"/> Depressional Basin
<input type="checkbox"/> Drainage Channel	<input type="checkbox"/> Constructed Basin	<input type="checkbox"/> Rock Basin
<input type="checkbox"/> Excavated Ditch	<input type="checkbox"/> Unvegetated Depression	<input type="checkbox"/> Other: _____

Apparent Hydrologic Regime

<input type="checkbox"/> Perennial	<input type="checkbox"/> Standing Water (Depth: _____)
<input checked="" type="checkbox"/> Intermittent	<input type="checkbox"/> Flowing Water (Depth: _____)
<input type="checkbox"/> Ephemeral	<input checked="" type="checkbox"/> Dry at time of the survey

Indicators

<input type="checkbox"/> Standing or flowing water with no indication of recent precipitation	<input type="checkbox"/> Channel adjacent to shelf with steep side	<input type="checkbox"/> Natural / irrigation / manmade / ditch flowing into feature
<input type="checkbox"/> presence of hydrophytic vegetation	<input type="checkbox"/> Natural line, stain or mineral (salt) deposit	<input type="checkbox"/> Dated picture / account showing / referring to identifiable features
<input type="checkbox"/> Presence of hydric soil with or without hydrophytic vegetation	<input checked="" type="checkbox"/> Litter, debris and or clay deposits	<input checked="" type="checkbox"/> Wetland symbol on map (presence of solid or dotted blue line, solid, shaded or stippled blue area on map)
<input type="checkbox"/> Absence of vegetation or interruption of upland vegetation	<input type="checkbox"/> Algae or alga mat	<input type="checkbox"/> Other (Specify)

Notes:

- BLUE LINE STREAM ON USGS CALABASAS QUAD
- NHD INT. STREAM
- NWI PSSA
- SPARSE LITTER / DEBRIS, WRACK LINES IN CHANNEL

Channel Characteristics

Channel Width	11.5 FT	
Channel Depth	~1 FT	
Low Flow Width	9 FT	
Low Flow Depth	~1 FT	
Channel Substrate (check all that apply)		
<input checked="" type="checkbox"/> Sand	<input type="checkbox"/> Cobble	<input type="checkbox"/> Silt / Clay
<input type="checkbox"/> Gravel	<input checked="" type="checkbox"/> Rock	<input type="checkbox"/> Other _____
SANDY CHANNEL w/ SCATTERED SANDSTONE ROCK		

Vegetation Characteristics of Channel or Basin

Vegetated Channel or Basin?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	< 5% TOTAL COVER
Dominant / Characteristic Species		SEEDLINGS	
CARDUUS PYCNOCEPHALUS		MOSBY	
PIPTATHERUM MILACEUM			

Vegetation Adjacent to Channel

Dominant / Characteristic Species
QUERCUS AGRIFOLIA - ALONG UPPER SLOPES
RIBES MALVACEUM, TOXICODENDRON DIVERSILOBUM,
SAMBUCUS NIGRA, PIHACELIA RAMOSISSIMA

Notes: SAMPLE POINT JUST DOWN STREAM OF
 52-INCH DIAM CMP OUTFALL
 - GOOD RIPARIAN COVER IN THIS AREA

ARID REGIONS - WETLAND DELINEATION DATA SHEET

Project: NASA - Santa Susana Field Lab Date: 1/4/2012Observers: Russell Huddleston and Steve LongFeature Name NORTHERN DRAINAGE Sample Point ND - 6GPS Location: 34° 14' 13.612" 118° 41' 18.709"

Geomorphic Feature

<input type="checkbox"/> River	<input type="checkbox"/> Lake	<input type="checkbox"/> Swale
<input checked="" type="checkbox"/> Stream	<input type="checkbox"/> Pond	<input type="checkbox"/> Erosional Channel
<input type="checkbox"/> Canal	<input type="checkbox"/> Impoundment	<input type="checkbox"/> Gully
<input type="checkbox"/> Irrigation Channel	<input type="checkbox"/> Playa	<input type="checkbox"/> Depressional Basin
<input type="checkbox"/> Drainage Channel	<input type="checkbox"/> Constructed Basin	<input type="checkbox"/> Rock Basin
<input type="checkbox"/> Excavated Ditch	<input type="checkbox"/> Unvegetated Depression	<input type="checkbox"/> Other: _____

Apparent Hydrologic Regime

<input type="checkbox"/> Perennial	<input type="checkbox"/> Standing Water (Depth: _____)
<input checked="" type="checkbox"/> Intermittent	<input type="checkbox"/> Flowing Water (Depth: _____)
<input type="checkbox"/> Ephemeral	<input checked="" type="checkbox"/> Dry at time of the survey

Indicators

<input type="checkbox"/> Standing or flowing water with no indication of recent precipitation	<input type="checkbox"/> Channel adjacent to shelf with steep side	<input type="checkbox"/> Natural / irrigation / manmade / ditch flowing into feature
<input type="checkbox"/> presence of hydrophytic vegetation	<input type="checkbox"/> Natural line, stain or mineral (salt) deposit	<input type="checkbox"/> Dated picture / account showing / referring to identifiable features
<input type="checkbox"/> Presence of hydric soil with or without hydrophytic vegetation	<input type="checkbox"/> Litter, debris and or clay deposits	<input checked="" type="checkbox"/> Wetland symbol on map (presence of solid or dotted blue line, solid, shaded or stippled blue area on map)
<input type="checkbox"/> Absence of vegetation or interruption of upland vegetation	<input type="checkbox"/> Algae or alga mat	<input type="checkbox"/> Other (Specify)

Notes:

- BLUE LINE ON USGS CALABASAS QUAD
- MTD INT. STREAM
- NW1 - PSSA

Channel Characteristics

Channel Width	12 FT
Channel Depth	1-2 FT
Low Flow Width	8 FT
Low Flow Depth	6 INCHES
Channel Substrate (check all that apply)	
<input checked="" type="checkbox"/> Sand	<input checked="" type="checkbox"/> Cobble
<input type="checkbox"/> Gravel	<input checked="" type="checkbox"/> Rock
<input type="checkbox"/> Silt / Clay	
<input checked="" type="checkbox"/> Other SANDSTONE BULPERS	
MOSTLY SAND W/ SOME COBBLES / ROCKS	

Vegetation Characteristics of Channel or Basin

Vegetated Channel or Basin?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	< 5% TOTAL
Dominant / Characteristic Species			COVER
PIPTATHERUM MILACEUM			
POYPOGON MONSPELIENSIS			
CARDUUS PYCNOCEPHALUS			

Vegetation Adjacent to Channel

Dominant / Characteristic Species
QUERCUS AGRIFOLIA - UPPER SLOPES
TOXICODENDRON DIVERSILOBUM
PHACELIA RAMOSISSIMA

Notes:

ARID REGIONS - WETLAND DELINEATION DATA SHEET

Project: NASA - Santa Susana Field Lab Date: 1/4/2012Observers: Russell Huddleston and Steve LongFeature Name NORTHERN DRAINAGE Sample Point ND-7GPS Location: 34° 14' 14.543" 118° 41' 20.809"

Geomorphic Feature

<input type="checkbox"/> River	<input type="checkbox"/> Lake	<input type="checkbox"/> Swale
<input checked="" type="checkbox"/> Stream	<input type="checkbox"/> Pond	<input type="checkbox"/> Erosional Channel
<input type="checkbox"/> Canal	<input type="checkbox"/> Impoundment	<input type="checkbox"/> Gully
<input type="checkbox"/> Irrigation Channel	<input type="checkbox"/> Playa	<input type="checkbox"/> Depressional Basin
<input type="checkbox"/> Drainage Channel	<input type="checkbox"/> Constructed Basin	<input type="checkbox"/> Rock Basin
<input type="checkbox"/> Excavated Ditch	<input type="checkbox"/> Unvegetated Depression	<input type="checkbox"/> Other: _____

Apparent Hydrologic Regime

<input type="checkbox"/> Perennial	<input type="checkbox"/> Standing Water (Depth: _____)
<input checked="" type="checkbox"/> Intermittent	<input type="checkbox"/> Flowing Water (Depth: _____)
<input type="checkbox"/> Ephemeral	<input checked="" type="checkbox"/> Dry at time of the survey

Indicators

<input type="checkbox"/> Standing or flowing water with no indication of recent precipitation	<input type="checkbox"/> Channel adjacent to shelf with steep side	<input type="checkbox"/> Natural / irrigation / manmade / ditch flowing into feature
<input type="checkbox"/> presence of hydrophytic vegetation	<input type="checkbox"/> Natural line, stain or mineral (salt) deposit	<input type="checkbox"/> Dated picture / account showing / referring to identifiable features
<input type="checkbox"/> Presence of hydric soil with or without hydrophytic vegetation	<input type="checkbox"/> Litter, debris and or clay deposits	<input checked="" type="checkbox"/> Wetland symbol on map (presence of solid or dotted blue line, solid, shaded or stippled blue area on map)
<input type="checkbox"/> Absence of vegetation or interruption of upland vegetation	<input type="checkbox"/> Algae or alga mat	<input type="checkbox"/> Other (Specify)

Notes:

- BLUE LINE ON USGS CALABASAS QUAD
- NHD INT. STREAM
- NW1 - PSSA

Channel Characteristics

Channel Width	12 FT
Channel Depth	~1 FT
Low Flow Width	6 FT
Low Flow Depth	6 INCHES
Channel Substrate (check all that apply)	
<input checked="" type="checkbox"/> Sand	<input checked="" type="checkbox"/> Cobble
<input checked="" type="checkbox"/> Gravel	<input type="checkbox"/> Rock
<input type="checkbox"/> Silt / Clay	
<input type="checkbox"/> Other _____	
SANDY CHANNEL W/ SOME GRAVELS / COBBLE	

Vegetation Characteristics of Channel or Basin

Vegetated Channel or Basin?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Dominant / Characteristic Species		
BACCHARIS SALICIFOLIA - SPARSE < 5% COVER		
PIPTATHERUM MILACEUM		
CARDUUS PYNOCEPHALUS		
RUMEX CRISPUS		
LESS THAN 5% TOTAL COVER		

Vegetation Adjacent to Channel

Dominant / Characteristic Species
QUERCUS AGRIFOLIA - UPPER SLOPES
ARTEMISIA DOUGLASIANA
MALACOTHAMNUS FASCICULATUS
PIPTATHERUM MILACEUM
PHACELIA RAMOSISSIMA
BRASSICA NIGRA

Notes:

ARID REGIONS - WETLAND DELINEATION DATA SHEET

Project: NASA - Santa Susana Field Lab Date: 1/4 / 2012Observers: Russell Huddleston and Steve LongFeature Name: AREA 1 - EROSIONAL CHAN. Sample Point _____GPS Location: STA 34° 14' 22.412" 118° 41' 18.196"

Geomorphic Feature

<input type="checkbox"/> River	<input type="checkbox"/> Lake	<input type="checkbox"/> Swale
<input type="checkbox"/> Stream	<input type="checkbox"/> Pond	<input checked="" type="checkbox"/> Erosional Channel
<input type="checkbox"/> Canal	<input type="checkbox"/> Impoundment	<input type="checkbox"/> Gully
<input type="checkbox"/> Irrigation Channel	<input type="checkbox"/> Playa	<input type="checkbox"/> Depressional Basin
<input type="checkbox"/> Drainage Channel	<input type="checkbox"/> Constructed Basin	<input type="checkbox"/> Rock Basin
<input type="checkbox"/> Excavated Ditch	<input type="checkbox"/> Unvegetated Depression	<input type="checkbox"/> Other: _____

Apparent Hydrologic Regime

<input type="checkbox"/> Perennial	<input type="checkbox"/> Standing Water (Depth: _____)
<input type="checkbox"/> Intermittent	<input type="checkbox"/> Flowing Water (Depth: _____)
<input checked="" type="checkbox"/> Ephemeral	<input checked="" type="checkbox"/> Dry at time of the survey

Indicators

<input type="checkbox"/> Standing or flowing water with no indication of recent precipitation	<input type="checkbox"/> Channel adjacent to shelf with steep side	<input type="checkbox"/> Natural / irrigation / manmade / ditch flowing into feature
<input type="checkbox"/> presence of hydrophytic vegetation	<input type="checkbox"/> Natural line, stain or mineral (salt) deposit	<input type="checkbox"/> Dated picture / account showing / referring to identifiable features
<input type="checkbox"/> Presence of hydric soil with or without hydrophytic vegetation	<input type="checkbox"/> Litter, debris and or clay deposits	<input type="checkbox"/> Wetland symbol on map (presence of solid or dotted blue line, solid, shaded or stippled blue area on map)
<input checked="" type="checkbox"/> Absence of vegetation or interruption of upland vegetation	<input type="checkbox"/> Algae or alga mat	<input checked="" type="checkbox"/> Other (Specify)

Notes: - DEFINED CUT CHANNEL DUE TO EROSION / UPSLOPE RUNOFF - CHANNEL FLOWS TO SOUTHWEST INTO IMPOUNDMENT FEATURE

- NOT A BLUE LINE FEATURE

Channel Characteristics

Channel Width	2 FT - 2 1/2 FT	
Channel Depth	5 INCHES - 1 FT DEEP	
Low Flow Width	1 FT	
Low Flow Depth	2-3 INCHES	
Channel Substrate (check all that apply)		
<input checked="" type="checkbox"/> Sand	<input type="checkbox"/> Cobble	<input type="checkbox"/> Silt / Clay
<input type="checkbox"/> Gravel	<input checked="" type="checkbox"/> Rock	<input type="checkbox"/> Other _____
SANDY W/ SOME SANDSTONE BEDROCK		

Vegetation Characteristics of Channel or Basin

Vegetated Channel or Basin?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Dominant / Characteristic Species		

Vegetation Adjacent to Channel

Dominant / Characteristic Species
ERIODICTYON CRASSIFOLIUM,
ADENOSTOMA FASCICULATUM, MALOSOMA LAURINA,
ERODIUM BOTRYS, CENTAUREA MELITENSIS
POA SECUNDA

Notes:

ARID REGIONS - WETLAND DELINEATION DATA SHEET

Project: NASA - Santa Susana Field LabDate: 1/4/2012Observers: Russell Huddleston and Steve LongFeature Name NORTHERN DRAINAGE Sample Point ND-8GPS Location: 34° 14' 16.403" 118° 41' 32.614"

Geomorphic Feature

<input type="checkbox"/> River	<input type="checkbox"/> Lake	<input type="checkbox"/> Swale
<input checked="" type="checkbox"/> Stream	<input type="checkbox"/> Pond	<input type="checkbox"/> Erosional Channel
<input type="checkbox"/> Canal	<input type="checkbox"/> Impoundment	<input type="checkbox"/> Gully
<input type="checkbox"/> Irrigation Channel	<input type="checkbox"/> Playa	<input type="checkbox"/> Depressional Basin
<input type="checkbox"/> Drainage Channel	<input type="checkbox"/> Constructed Basin	<input type="checkbox"/> Rock Basin
<input type="checkbox"/> Excavated Ditch	<input type="checkbox"/> Unvegetated Depression	<input type="checkbox"/> Other: _____

Apparent Hydrologic Regime

<input type="checkbox"/> Perennial	<input type="checkbox"/> Standing Water (Depth: _____)
<input checked="" type="checkbox"/> Intermittent	<input type="checkbox"/> Flowing Water (Depth: _____)
<input type="checkbox"/> Ephemeral	<input checked="" type="checkbox"/> Dry at time of the survey

Indicators

<input type="checkbox"/> Standing or flowing water with no indication of recent precipitation	<input checked="" type="checkbox"/> Channel adjacent to shelf with steep side	<input type="checkbox"/> Natural / irrigation / manmade / ditch flowing into feature
<input type="checkbox"/> presence of hydrophytic vegetation	<input type="checkbox"/> Natural line, stain or mineral (salt) deposit	<input type="checkbox"/> Dated picture / account showing / referring to identifiable features
<input type="checkbox"/> Presence of hydric soil with or without hydrophytic vegetation	<input checked="" type="checkbox"/> Litter, debris and or clay deposits	<input checked="" type="checkbox"/> Wetland symbol on map (presence of solid or dotted blue line, solid, shaded or stippled blue area on map)
<input type="checkbox"/> Absence of vegetation or interruption of upland vegetation	<input type="checkbox"/> Algae or alga mat	<input type="checkbox"/> Other (Specify)

Notes:

- BLUE LINE ON USGS CALABASAS QUAD
- NITD INT. STREAM
- NW1 - PSSA
- DISTINCT CUT BANKS ALONG CHANNEL
- DRIFT / DEBRIS DEPOSITS

Channel Characteristics

Channel Width	6 FT		
Channel Depth	1 FT		
Low Flow Width	3 FT		
Low Flow Depth	6 INCHES		
Channel Substrate (check all that apply)			
<input checked="" type="checkbox"/> Sand	<input checked="" type="checkbox"/> Cobble	<input type="checkbox"/> Silt / Clay	
<input type="checkbox"/> Gravel	<input checked="" type="checkbox"/> Rock - SANDSTONE BOULDER	<input type="checkbox"/> Other	
SANDY SUBSTRATE W/ SOME COBBLE / ROCKS			

Vegetation Characteristics of Channel or Basin

Vegetated Channel or Basin?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Dominant / Characteristic Species		
BACCHARIS SALICIFOLIA - LESS THAN 5% COVER		
POLYPOGON MONSPELIENSIS CARDUUS PYCNOCEPHALUS RUMEX CRISPUS		
} TOTAL LESS THAN 5% COVER		

Vegetation Adjacent to Channel

Dominant / Characteristic Species
QUERCUS AGRIFOLIA
SALIX LASIOLEPIS - ONE TREE / SHRUB W/ MULTIPLE STEMS - ALL LESS THAN 3" DBH
TOXICODENDRON DIVERSILOBUM
CARDUUS PYCNOCEPHALUS, PITACELIA RAMOSISSIMA

Notes:

DOWN STREAM OF THIS POINT SCATTERED
 PATCHES OF POLYPOGON MONSPELIENSIS BUT
 VEGETATION GENERALLY SPARSE IN CHANNEL

- SCATTERED PIPTATHERUM MILACEUM ALSO
 PRESENT IN SOME PARTS OF THE
 CHANNEL

ARID REGIONS - WETLAND DELINEATION DATA SHEET

Project: NASA - Santa Susana Field Lab Date: 1/4/2012Observers: Russell Huddleston and Steve LongFeature Name NORTHERN DRAINAGE Sample Point ND-9GPS Location: 34° 14' 17.942" 118° 41' 34.771"

Geomorphic Feature

<input type="checkbox"/> River	<input type="checkbox"/> Lake	<input type="checkbox"/> Swale
<input checked="" type="checkbox"/> Stream	<input type="checkbox"/> Pond	<input type="checkbox"/> Erosional Channel
<input type="checkbox"/> Canal	<input type="checkbox"/> Impoundment	<input type="checkbox"/> Gully
<input type="checkbox"/> Irrigation Channel	<input type="checkbox"/> Playa	<input type="checkbox"/> Depressional Basin
<input type="checkbox"/> Drainage Channel	<input type="checkbox"/> Constructed Basin	<input type="checkbox"/> Rock Basin
<input type="checkbox"/> Excavated Ditch	<input type="checkbox"/> Unvegetated Depression	<input type="checkbox"/> Other: _____

Apparent Hydrologic Regime

<input type="checkbox"/> Perennial	<input type="checkbox"/> Standing Water (Depth: _____)
<input checked="" type="checkbox"/> Intermittent	<input type="checkbox"/> Flowing Water (Depth: _____)
<input type="checkbox"/> Ephemeral	<input checked="" type="checkbox"/> Dry at time of the survey

Indicators

<input type="checkbox"/> Standing or flowing water with no indication of recent precipitation	<input type="checkbox"/> Channel adjacent to shelf with steep side	<input type="checkbox"/> Natural / irrigation / manmade / ditch flowing into feature
<input type="checkbox"/> presence of hydrophytic vegetation	<input type="checkbox"/> Natural line, stain or mineral (salt) deposit	<input type="checkbox"/> Dated picture / account showing / referring to identifiable features
<input type="checkbox"/> Presence of hydric soil with or without hydrophytic vegetation	<input checked="" type="checkbox"/> Litter, debris and or clay deposits	<input checked="" type="checkbox"/> Wetland symbol on map (presence of solid or dotted blue line, solid, shaded or stippled blue area on map)
<input type="checkbox"/> Absence of vegetation or interruption of upland vegetation	<input type="checkbox"/> Algae or alga mat	<input type="checkbox"/> Other (Specify)

Notes:

- BLUE LINE ON USGS CALABASAS QUAD
- NHD INTERMITTENT STREAM
- NWI - PSSA

Channel Characteristics

Channel Width	10 FT
Channel Depth	1.5-2 FT
Low Flow Width	4 FT
Low Flow Depth	26 INCHES
Channel Substrate (check all that apply)	
<input type="checkbox"/> Sand	<input type="checkbox"/> Cobble
<input type="checkbox"/> Gravel	<input checked="" type="checkbox"/> Rock
<input type="checkbox"/> Silt / Clay	
<input type="checkbox"/> Other _____	
SANDSTONE BEDROCK / BOULDERS	

Vegetation Characteristics of Channel or Basin

Vegetated Channel or Basin?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Dominant / Characteristic Species		

Vegetation Adjacent to Channel

Dominant / Characteristic Species
QUERCUS AGRIFOLIA, KECKIELLA CORDIFOLIA,
SALVIA MELIFERA, BRASSICA NIGRA
PHACELIA RAMOSISSIMA, CARDUUS PYLNOCEPHALUS
PIPTATHERUM MILACEUM

Notes: DOWN STREAM OF THIS POINT VERY LARGE SANDSTONE BOULDERS IN THE CHANNEL FOR APPROX 300 FT
NO ACCESS TO THIS PORTION OF THE CHANNEL - WATER APPEARS TO FLOW UNDER ROCKS IN THIS AREA

ARID REGIONS - WETLAND DELINEATION DATA SHEET

Project: NASA - Santa Susana Field Lab Date: 11/4/2012Observers: Russell Huddleston and Steve LongFeature Name NORTHERN DRAINAGE Sample Point ND-10GPS Location: 34° 14' 18.352" 118° 41' 40.599"

Geomorphic Feature

<input type="checkbox"/> River	<input type="checkbox"/> Lake	<input type="checkbox"/> Swale
<input checked="" type="checkbox"/> Stream	<input type="checkbox"/> Pond	<input type="checkbox"/> Erosional Channel
<input type="checkbox"/> Canal	<input type="checkbox"/> Impoundment	<input type="checkbox"/> Gully
<input type="checkbox"/> Irrigation Channel	<input type="checkbox"/> Playa	<input type="checkbox"/> Depressional Basin
<input type="checkbox"/> Drainage Channel	<input type="checkbox"/> Constructed Basin	<input type="checkbox"/> Rock Basin
<input type="checkbox"/> Excavated Ditch	<input type="checkbox"/> Unvegetated Depression	<input type="checkbox"/> Other: _____

Apparent Hydrologic Regime

<input type="checkbox"/> Perennial	<input type="checkbox"/> Standing Water (Depth: _____)
<input checked="" type="checkbox"/> Intermittent	<input type="checkbox"/> Flowing Water (Depth: _____)
<input type="checkbox"/> Ephemeral	<input checked="" type="checkbox"/> Dry at time of the survey

Indicators

<input type="checkbox"/> Standing or flowing water with no indication of recent precipitation	<input type="checkbox"/> Channel adjacent to shelf with steep side	<input type="checkbox"/> Natural / irrigation / manmade / ditch flowing into feature
<input type="checkbox"/> presence of hydrophytic vegetation	<input type="checkbox"/> Natural line, stain or mineral (salt) deposit	<input type="checkbox"/> Dated picture / account showing / referring to identifiable features
<input type="checkbox"/> Presence of hydric soil with or without hydrophytic vegetation	<input checked="" type="checkbox"/> Litter, debris and or clay deposits	<input checked="" type="checkbox"/> Wetland symbol on map (presence of solid or dotted blue line, solid, shaded or stippled blue area on map)
<input type="checkbox"/> Absence of vegetation or interruption of upland vegetation	<input type="checkbox"/> Algae or alga mat	<input type="checkbox"/> Other (Specify)

Notes:

- BLUE LINE ON USGS CALABASAS QUAD
- NHD INT. STREAM
- NWI - PSSA

ARID REGIONS - WETLAND DELINEATION DATA SHEET

Project: NASA - Santa Susana Field Lab Date: 1/6/2012Observers: Russell Huddleston and Steve LongFeature Name ELV DRAINAGE Sample Point ELV -1GPS Location: 34° 14' 16.023" 118° 41' 41.211"

Geomorphic Feature

<input type="checkbox"/> River	<input type="checkbox"/> Lake	<input type="checkbox"/> Swale
<input checked="" type="checkbox"/> Stream	<input type="checkbox"/> Pond	<input type="checkbox"/> Erosional Channel
<input type="checkbox"/> Canal	<input type="checkbox"/> Impoundment	<input type="checkbox"/> Gully
<input type="checkbox"/> Irrigation Channel	<input type="checkbox"/> Playa	<input type="checkbox"/> Depressional Basin
<input type="checkbox"/> Drainage Channel	<input type="checkbox"/> Constructed Basin	<input type="checkbox"/> Rock Basin
<input type="checkbox"/> Excavated Ditch	<input type="checkbox"/> Unvegetated Depression	<input type="checkbox"/> Other: _____

Apparent Hydrologic Regime

<input type="checkbox"/> Perennial	<input type="checkbox"/> Standing Water (Depth: _____)
<input type="checkbox"/> Intermittent	<input type="checkbox"/> Flowing Water (Depth: _____)
<input checked="" type="checkbox"/> Ephemeral	<input checked="" type="checkbox"/> Dry at time of the survey

Indicators

<input type="checkbox"/> Standing or flowing water with no indication of recent precipitation	<input type="checkbox"/> Channel adjacent to shelf with steep side	<input type="checkbox"/> Natural / irrigation / manmade / ditch flowing into feature
<input type="checkbox"/> presence of hydrophytic vegetation	<input type="checkbox"/> Natural line, stain or mineral (salt) deposit	<input type="checkbox"/> Dated picture / account showing / referring to identifiable features
<input type="checkbox"/> Presence of hydric soil with or without hydrophytic vegetation	<input type="checkbox"/> Litter, debris and or clay deposits	<input type="checkbox"/> Wetland symbol on map (presence of solid or dotted blue line, solid, shaded or stippled blue area on map)
<input type="checkbox"/> Absence of vegetation or interruption of upland vegetation	<input type="checkbox"/> Algae or alga mat	<input type="checkbox"/> Other (Specify)

Notes: NOT SHOWN AS A BLUE LINE

NO STRONG EVIDENCE OF REGULAR FLOWS OTHER THAN TOPOGRAPHIC LOW WITH SOMEWHAT DEFINED CHANNEL

Channel Characteristics

Channel Width	4 FT	
Channel Depth	21 FT	
Low Flow Width	3 FT	
Low Flow Depth	6 INCHES	
Channel Substrate (check all that apply)		
<input checked="" type="checkbox"/> Sand	<input type="checkbox"/> Cobble	<input type="checkbox"/> Silt / Clay
<input type="checkbox"/> Gravel	<input type="checkbox"/> Rock	<input checked="" type="checkbox"/> Other SANDSTONE BOULDERS

Vegetation Characteristics of Channel or Basin

Vegetated Channel or Basin?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Dominant / Characteristic Species		

Vegetation Adjacent to Channel

Dominant / Characteristic Species
QUERCUS AGRIFOLIA, UMBELLULARIA CALIFORNICA,
MALACOTHAMNUS FASCICULATUS, ADENOSTOMA FASCICULATUM,
HERTERMELES ARBUTIFOLIA, Ceanothus CRASSIFOLUS,
TOXICODENDRON DIVERSILOBUM, CARDUUS PLYNOCEPHALUS,
PHACELIA RAMOSISSIMA, VENEGASIA CARPESIOIDES
LEYMUS CONDENSATUS

Notes: - MORE DEVELOPED CHANNEL UPSLOPE

LOTS OF DOWNED WOODY DEBRIS IN THE CHANNEL IN THIS AREA

DENSE TOXICODENDRON DIVERSILOBUM IN SOME AREAS

ARID REGIONS - WETLAND DELINEATION DATA SHEET

Project: NASA - Santa Susana Field Lab Date: 1/6/2012Observers: Russell Huddleston and Steve LongFeature Name ELV DRAINAGE Sample Point ELV-2GPS Location: 34° 14' 17.840 118° 41' 41.018

Geomorphic Feature

<input type="checkbox"/> River	<input type="checkbox"/> Lake	<input type="checkbox"/> Swale
<input checked="" type="checkbox"/> Stream	<input type="checkbox"/> Pond	<input type="checkbox"/> Erosional Channel
<input type="checkbox"/> Canal	<input type="checkbox"/> Impoundment	<input type="checkbox"/> Gully
<input type="checkbox"/> Irrigation Channel	<input type="checkbox"/> Playa	<input type="checkbox"/> Depressional Basin
<input type="checkbox"/> Drainage Channel	<input type="checkbox"/> Constructed Basin	<input type="checkbox"/> Rock Basin
<input type="checkbox"/> Excavated Ditch	<input type="checkbox"/> Unvegetated Depression	<input type="checkbox"/> Other: _____

Apparent Hydrologic Regime

<input type="checkbox"/> Perennial	<input type="checkbox"/> Standing Water (Depth: _____)
<input type="checkbox"/> Intermittent	<input type="checkbox"/> Flowing Water (Depth: _____)
<input checked="" type="checkbox"/> Ephemeral	<input checked="" type="checkbox"/> Dry at time of the survey

Indicators

<input type="checkbox"/> Standing or flowing water with no indication of recent precipitation	<input type="checkbox"/> Channel adjacent to shelf with steep side	<input type="checkbox"/> Natural / irrigation / manmade / ditch flowing into feature
<input type="checkbox"/> presence of hydrophytic vegetation	<input type="checkbox"/> Natural line, stain or mineral (salt) deposit	<input type="checkbox"/> Dated picture / account showing / referring to identifiable features
<input type="checkbox"/> Presence of hydric soil with or without hydrophytic vegetation	<input type="checkbox"/> Litter, debris and or clay deposits	<input type="checkbox"/> Wetland symbol on map (presence of solid or dotted blue line, solid, shaded or stippled blue area on map)
<input type="checkbox"/> Absence of vegetation or interruption of upland vegetation	<input type="checkbox"/> Algae or alga mat	<input type="checkbox"/> Other (Specify)

Notes: NOT A BLUE LINE FEATURE

NO EVIDENCE OF RECENT FLOW - LOW TOPOGRAPHIC FEATURE, SOME DEFINED CHANNEL - BUT MORE SWALE LIKE FEATURE

Channel Characteristics

Channel Width	~10 FT	
Channel Depth	1 FT	
Low Flow Width	2.5 FT	
Low Flow Depth	6 INCHES	
Channel Substrate (check all that apply)		
<input type="checkbox"/> Sand	<input type="checkbox"/> Cobble	<input type="checkbox"/> Silt / Clay
<input type="checkbox"/> Gravel	<input checked="" type="checkbox"/> Rock	<input checked="" type="checkbox"/> Other <u>SANDSTONE</u> <u>BOULDERS</u>
<u>ROCKY / SWALE</u>		

Vegetation Characteristics of Channel or Basin

Vegetated Channel or Basin?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Dominant / Characteristic Species		

Vegetation Adjacent to Channel

Dominant / Characteristic Species
<u>QUERCUS AGRIFOLIA, UMBELLARIA CALIFORNICA,</u>
<u>TOXICODENDRON DIVERSILOBUM, ROSA CALIFORNICA,</u>
<u>HEPATEROMILES ARBUTIFOLIA,</u>
<u>MALACOTHAMNUS FASICULATUS</u>
<u>PIPTATHERUM MILECRUM</u>

Notes:

THIS FEATURE FLOWS INTO THE NORTHERN
DRAINAGE TUST UPSTREAM OF SAMPLE WEIR

ARID REGIONS - WETLAND DELINEATION DATA SHEET

Project: NASA - Santa Susana Field LabDate: 1/6/2012Observers: Russell Huddleston and Steve LongFeature Name ELV DRAINAGE Sample Point ELV-3GPS Location: 34° 14' 13.651" 118° 41' 42.620"

Geomorphic Feature

<input type="checkbox"/> River	<input type="checkbox"/> Lake	<input type="checkbox"/> Swale
<input checked="" type="checkbox"/> Stream	<input type="checkbox"/> Pond	<input type="checkbox"/> Erosional Channel
<input type="checkbox"/> Canal	<input type="checkbox"/> Impoundment	<input type="checkbox"/> Gully
<input type="checkbox"/> Irrigation Channel	<input type="checkbox"/> Playa	<input type="checkbox"/> Depressional Basin
<input type="checkbox"/> Drainage Channel	<input type="checkbox"/> Constructed Basin	<input type="checkbox"/> Rock Basin
<input type="checkbox"/> Excavated Ditch	<input type="checkbox"/> Unvegetated Depression	<input type="checkbox"/> Other: _____

Apparent Hydrologic Regime

<input type="checkbox"/> Perennial	<input type="checkbox"/> Standing Water (Depth: _____)
<input type="checkbox"/> Intermittent	<input type="checkbox"/> Flowing Water (Depth: _____)
<input checked="" type="checkbox"/> Ephemeral	<input checked="" type="checkbox"/> Dry at time of the survey

Indicators

<input type="checkbox"/> Standing or flowing water with no indication of recent precipitation	<input type="checkbox"/> Channel adjacent to shelf with steep side	<input type="checkbox"/> Natural / irrigation / manmade / ditch flowing into feature
<input type="checkbox"/> presence of hydrophytic vegetation	<input type="checkbox"/> Natural line, stain or mineral (salt) deposit	<input type="checkbox"/> Dated picture / account showing / referring to identifiable features
<input type="checkbox"/> Presence of hydric soil with or without hydrophytic vegetation	<input type="checkbox"/> Litter, debris and or clay deposits	<input type="checkbox"/> Wetland symbol on map (presence of solid or dotted blue line, solid, shaded or stippled blue area on map)
<input type="checkbox"/> Absence of vegetation or interruption of upland vegetation	<input type="checkbox"/> Algae or alga mat	<input type="checkbox"/> Other (Specify)

Notes: NOT A BLUE LINE

- NO EVIDENCE OF RECENT FLOW IN THIS AREA, LOW TOPOGRAPHIC AREA - SWALE LIKE FEATURE - MORE DEFINED UPSTREAM

Channel Characteristics

Channel Width	7 FT	
Channel Depth	1 FT	
Low Flow Width	3.5 FT	
Low Flow Depth	46 INCHES	
Channel Substrate (check all that apply)		
<input checked="" type="checkbox"/> Sand	<input type="checkbox"/> Cobble	<input type="checkbox"/> Silt / Clay
<input checked="" type="checkbox"/> Gravel	<input checked="" type="checkbox"/> Rock	<input checked="" type="checkbox"/> Other SANDSTONE BOULDER

Vegetation Characteristics of Channel or Basin

Vegetated Channel or Basin?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Dominant / Characteristic Species		

Vegetation Adjacent to Channel

Dominant / Characteristic Species
QUERCUS AGRIFOLIA, MALACOTHAMNUS FASCICULATUM
MALOSOMA LAURINA, RIBES MALVACEUM,
ARTEMESIA CALIFORNICA, MIMULUS AURANTIUMUS
PHACALEA RAMOSISSIMA, VERGASIA CARTESIOIDES

Notes:

ARID REGIONS - WETLAND DELINEATION DATA SHEET

Project: NASA - Santa Susana Field Lab Date: 1/6/2012Observers: Russell Huddleston and Steve LongFeature Name DRAINAGE A-1 Sample Point A1-1GPS Location: 34° 14' 11.482" 118° 41' 39.657"

Geomorphic Feature

<input type="checkbox"/> River	<input type="checkbox"/> Lake	<input type="checkbox"/> Swale
<input type="checkbox"/> Stream	<input type="checkbox"/> Pond	<input type="checkbox"/> Erosional Channel
<input type="checkbox"/> Canal	<input type="checkbox"/> Impoundment	<input type="checkbox"/> Gully
<input type="checkbox"/> Irrigation Channel	<input type="checkbox"/> Playa	<input type="checkbox"/> Depressional Basin
<input checked="" type="checkbox"/> Drainage Channel	<input type="checkbox"/> Constructed Basin	<input type="checkbox"/> Rock Basin
<input type="checkbox"/> Excavated Ditch	<input type="checkbox"/> Unvegetated Depression	<input type="checkbox"/> Other: _____

Apparent Hydrologic Regime

<input type="checkbox"/> Perennial	<input type="checkbox"/> Standing Water (Depth: _____)
<input type="checkbox"/> Intermittent	<input type="checkbox"/> Flowing Water (Depth: _____)
<input checked="" type="checkbox"/> Ephemeral	<input checked="" type="checkbox"/> Dry at time of the survey

Indicators

<input type="checkbox"/> Standing or flowing water with no indication of recent precipitation	<input type="checkbox"/> Channel adjacent to shelf with steep side	<input type="checkbox"/> Natural / irrigation / manmade / ditch flowing into feature
<input type="checkbox"/> presence of hydrophytic vegetation	<input type="checkbox"/> Natural line, stain or mineral (salt) deposit	<input type="checkbox"/> Dated picture / account showing / referring to identifiable features
<input type="checkbox"/> Presence of hydric soil with or without hydrophytic vegetation	<input type="checkbox"/> Litter, debris and or clay deposits	<input type="checkbox"/> Wetland symbol on map (presence of solid or dotted blue line, solid, shaded or stippled blue area on map)
<input type="checkbox"/> Absence of vegetation or interruption of upland vegetation	<input type="checkbox"/> Algae or alga mat	<input type="checkbox"/> Other (Specify)

Notes: NO BLUE LINE

- TOPOGRAPHIC LOW AREA - RIP-RAP / CULVERT AT ROADWAY - UPSLOPE WEAKLY EXPRESSED EROSIONAL FEATURE

Channel Characteristics

Channel Width	2 FT	
Channel Depth	1.5 FT	
Low Flow Width	1.5 FT	
Low Flow Depth	6 INCHES	
Channel Substrate (check all that apply)		
<input checked="" type="checkbox"/> Sand	<input checked="" type="checkbox"/> Cobble (SPARSE)	<input type="checkbox"/> Silt / Clay
<input type="checkbox"/> Gravel	<input type="checkbox"/> Rock	<input type="checkbox"/> Other _____

Vegetation Characteristics of Channel or Basin

Vegetated Channel or Basin?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Dominant / Characteristic Species		

Vegetation Adjacent to Channel

Dominant / Characteristic Species
QUERCUS AGRIFFOLIA, MALACOTHAMNUS FASICULATUM,
RIBES MALVACEUM, CARDUUS PYNOCLEPHALLUS,
PHACELIA RAMOSISSIMA

Notes: SWALE / CHANNEL EMPTIES INTO LOW DEPRESSIONAL AREA W/ RIP-RAP AND 29 INCH DIAM CULVERT (PLASTIC PIPE) UNDER ROAD

ARID REGIONS - WETLAND DELINEATION DATA SHEET

Project: NASA - Santa Susana Field Lab Date: 1/6/2012Observers: Russell Huddleston and Steve LongFeature Name DRAINAGE A-1 Sample Point A1-2GPS Location: 34° 14' 13.533" 118° 41' 42.086"

Geomorphic Feature

<input type="checkbox"/> River	<input type="checkbox"/> Lake	<input type="checkbox"/> Swale
<input type="checkbox"/> Stream	<input type="checkbox"/> Pond	<input type="checkbox"/> Erosional Channel
<input type="checkbox"/> Canal	<input type="checkbox"/> Impoundment	<input type="checkbox"/> Gully
<input type="checkbox"/> Irrigation Channel	<input type="checkbox"/> Playa	<input type="checkbox"/> Depressional Basin
<input checked="" type="checkbox"/> Drainage Channel	<input type="checkbox"/> Constructed Basin	<input type="checkbox"/> Rock Basin
<input type="checkbox"/> Excavated Ditch	<input type="checkbox"/> Unvegetated Depression	<input type="checkbox"/> Other: _____

Apparent Hydrologic Regime

<input type="checkbox"/> Perennial	<input type="checkbox"/> Standing Water (Depth: _____)
<input type="checkbox"/> Intermittent	<input type="checkbox"/> Flowing Water (Depth: _____)
<input checked="" type="checkbox"/> Ephemeral	<input checked="" type="checkbox"/> Dry at time of the survey

Indicators

<input type="checkbox"/> Standing or flowing water with no indication of recent precipitation	<input type="checkbox"/> Channel adjacent to shelf with steep side	<input type="checkbox"/> Natural / irrigation / manmade / ditch flowing into feature
<input type="checkbox"/> presence of hydrophytic vegetation	<input type="checkbox"/> Natural line, stain or mineral (salt) deposit	<input type="checkbox"/> Dated picture / account showing / referring to identifiable features
<input type="checkbox"/> Presence of hydric soil with or without hydrophytic vegetation	<input type="checkbox"/> Litter, debris and or clay deposits	<input type="checkbox"/> Wetland symbol on map (presence of solid or dotted blue line, solid, shaded or stippled blue area on map)
<input type="checkbox"/> Absence of vegetation or interruption of upland vegetation	<input type="checkbox"/> Algae or alga mat	<input type="checkbox"/> Other (Specify)

Notes:

NO BLUE LINE

LOW TOPOGRAPHIC SWALE, WEAKLY EXPRESSED CHANNEL

Channel Characteristics

Channel Width	8 FT	
Channel Depth	1 FT	
Low Flow Width	3 FT	
Low Flow Depth	26 INCHES	
Channel Substrate (check all that apply)		
<input checked="" type="checkbox"/> Sand	<input checked="" type="checkbox"/> Cobble	<input type="checkbox"/> Silt / Clay
<input type="checkbox"/> Gravel	<input type="checkbox"/> Rock	<input checked="" type="checkbox"/> Other <u>ASPHALT</u> <u>DEBRIS</u>

Vegetation Characteristics of Channel or Basin

Vegetated Channel or Basin?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Dominant / Characteristic Species		

Vegetation Adjacent to Channel

Dominant / Characteristic Species
SALVIA MELIFERA
BACCHARIS PILULARIS
MALOSOMA LAURINA
ERIODICTYON CRASSIFOLIUM

Notes: DOWN STREAM OF 29 INCH DIAM
PLASTIC PIPE UNDER ROAD
FLOWS WEST INTO ELV DRAINAGE

ARID REGIONS - WETLAND DELINEATION DATA SHEET

Project: NASA - Santa Susana Field LabDate: 1/6/2012Observers: Russell Huddleston and Steve LongFeature Name DRAINAGE A-2Sample Point ~~A2-2~~ A2-1GPS Location: 34° 14' 09.789" 118° 41' 47.834"

Geomorphic Feature

<input type="checkbox"/> River	<input type="checkbox"/> Lake	<input type="checkbox"/> Swale
<input type="checkbox"/> Stream	<input type="checkbox"/> Pond	<input type="checkbox"/> Erosional Channel
<input type="checkbox"/> Canal	<input type="checkbox"/> Impoundment	<input type="checkbox"/> Gully
<input type="checkbox"/> Irrigation Channel	<input type="checkbox"/> Playa	<input type="checkbox"/> Depressional Basin
<input checked="" type="checkbox"/> Drainage Channel	<input type="checkbox"/> Constructed Basin	<input type="checkbox"/> Rock Basin
<input type="checkbox"/> Excavated Ditch	<input type="checkbox"/> Unvegetated Depression	<input type="checkbox"/> Other: _____

Apparent Hydrologic Regime

<input type="checkbox"/> Perennial	<input type="checkbox"/> Standing Water (Depth: _____)
<input type="checkbox"/> Intermittent	<input type="checkbox"/> Flowing Water (Depth: _____)
<input checked="" type="checkbox"/> Ephemeral	<input checked="" type="checkbox"/> Dry at time of the survey

Indicators

<input type="checkbox"/> Standing or flowing water with no indication of recent precipitation	<input checked="" type="checkbox"/> Channel adjacent to shelf with steep side	<input type="checkbox"/> Natural / irrigation / manmade / ditch flowing into feature
<input type="checkbox"/> presence of hydrophytic vegetation	<input type="checkbox"/> Natural line, stain or mineral (salt) deposit	<input type="checkbox"/> Dated picture / account showing / referring to identifiable features
<input type="checkbox"/> Presence of hydric soil with or without hydrophytic vegetation	<input type="checkbox"/> Litter, debris and or clay deposits	<input type="checkbox"/> Wetland symbol on map (presence of solid or dotted blue line, solid, shaded or stippled blue area on map)
<input type="checkbox"/> Absence of vegetation or interruption of upland vegetation	<input type="checkbox"/> Algae or alga mat	<input type="checkbox"/> Other (Specify)

Notes: NOT A BLUE LINE

NO EVIDENCE OF RECENT FLOW IN THIS AREA

Channel Characteristics

Channel Width	6 FT - NEAR ROAD - NARROWS AS	
Channel Depth	2-4 FT	
Low Flow Width		
Low Flow Depth		
Channel Substrate (check all that apply)		
<input checked="" type="checkbox"/> Sand	<input type="checkbox"/> Cobble	<input type="checkbox"/> Silt / Clay
<input type="checkbox"/> Gravel	<input type="checkbox"/> Rock	<input type="checkbox"/> Other _____

Vegetation Characteristics of Channel or Basin

Vegetated Channel or Basin?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Dominant / Characteristic Species		
TOXICODENDRON DIVERSILOBUM } UPPER EDGES		
MIMULUS AURANTIA CUS } OF CHANNEL		

Vegetation Adjacent to Channel

Dominant / Characteristic Species
QUERCUS AGRIFOLIA, TOXICODENDRON DIVERSILOBUM,
CARDUUS PYNOCERPHALLUS, LEYMUS CONDENSATUS
PHACELIA RAMOSISSIMA, BROMUS DIANDRUS
PSEUDOGNAPHALUM BIOLETTI

Notes: WELL DEFINED DEEPLY INCISED CHANNEL
JUST UP FROM 24 INCH DIAM CMP AT
ROAD - CHANNELS BECOMES SMALLER
AND MORE NARROW TO THE SOUTH
EVENTUALLY BECOMING A DISCONTINUOUS
EROSIONAL CHANNEL

NORTH OF ROAD CMP EMPTIES INTO
ASPHALT DRAINAGE

ARID REGIONS - WETLAND DELINEATION DATA SHEET

Project: NASA - Santa Susana Field Lab Date: 1/5/2012Observers: Russell Huddleston and Steve LongFeature Name BELL CREEK - ALFA Sample Point ~~OFF RAIL LINE~~ BC-1GPS Location: AVE POINT: 34° 13' 58.097 118° 41' 36.895"

Geomorphic Feature

<input type="checkbox"/> River	<input type="checkbox"/> Lake	<input type="checkbox"/> Swale
<input checked="" type="checkbox"/> Stream	<input type="checkbox"/> Pond	<input type="checkbox"/> Erosional Channel
<input type="checkbox"/> Canal	<input checked="" type="checkbox"/> Impoundment	<input type="checkbox"/> Gully
<input type="checkbox"/> Irrigation Channel	<input type="checkbox"/> Playa	<input type="checkbox"/> Depressional Basin
<input type="checkbox"/> Drainage Channel	<input type="checkbox"/> Constructed Basin	<input type="checkbox"/> Rock Basin
<input type="checkbox"/> Excavated Ditch	<input type="checkbox"/> Unvegetated Depression	<input type="checkbox"/> Other: _____

Apparent Hydrologic Regime

<input type="checkbox"/> Perennial	<input type="checkbox"/> Standing Water (Depth: _____)
<input type="checkbox"/> Intermittent	<input type="checkbox"/> Flowing Water (Depth: _____)
<input checked="" type="checkbox"/> Ephemeral	<input checked="" type="checkbox"/> Dry at time of the survey

Indicators

<input type="checkbox"/> Standing or flowing water with no indication of recent precipitation	<input type="checkbox"/> Channel adjacent to shelf with steep side	<input type="checkbox"/> Natural / irrigation / manmade / ditch flowing into feature
<input type="checkbox"/> presence of hydrophytic vegetation	<input type="checkbox"/> Natural line, stain or mineral (salt) deposit	<input type="checkbox"/> Dated picture / account showing / referring to identifiable features
<input type="checkbox"/> Presence of hydric soil with or without hydrophytic vegetation	<input type="checkbox"/> Litter, debris and or clay deposits	<input checked="" type="checkbox"/> Wetland symbol on map (presence of solid or dotted blue line, solid, shaded or stippled blue area on map)
<input type="checkbox"/> Absence of vegetation or interruption of upland vegetation	<input type="checkbox"/> Algae or alga mat	<input type="checkbox"/> Other (Specify)

Notes: SHOWN AS BLUE LINE ON USGS TOPO MAP FOR THE CALABASAS QUAD; NHD STREAM - IMPOUNDED AREAS SHOWN AS PSSC ON NW1 (FORESTED/SHRUB WETLAND)

- NO EVIDENCE OF RECENT FLOW IN THIS AREA

Channel Characteristics

Channel Width	5.5 FT	} JUST BEFORE ENTERS 24" CMP AT WEST END OF THE PROJ. AREA
Channel Depth	2.5 FT	
High Water Line Width		
High Water Line Depth		
Channel Substrate (check all that apply)		
<input checked="" type="checkbox"/> Sand	<input type="checkbox"/> Cobble	<input type="checkbox"/> Silt / Clay
<input type="checkbox"/> Gravel	<input type="checkbox"/> Rock	<input type="checkbox"/> Other _____

Vegetation Characteristics of Channel or Basin

Vegetated Channel or Basin?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Dominant / Characteristic Species		

Vegetation Adjacent to Channel

Dominant / Characteristic Species
BACCHARIS SALICIFOLIA, TOXICODENDRON DIVERSILOBUM,
ADENOSTOMA FASCICULATUM, MALACOTHAMNUS FASCICULATUS,
MALOSOMA LAURINA, ERIOPICTON CRASSIFOLIUM

Notes: UPPER REACH GOES INTO 24 INCH DIAMETER
CULVERT UNDER FILL EAST OF ALPHA TEST
STANDS

- AT ~~THE~~ CULVERT DISCHARGE - ABOUT 60% FILLED
CULVERT OPENING - DENSE MESEMBRYANTHEMUM
CRYSTALLINUM IN DISCHARGE AREA - DOWN STREAM
NO DEFINED CHANNEL OR OTWUM - SOME BACCHARIS
SALICIFOLIA, SALIX LASIOLEPS W/ BRASSICA NIGRA AND
CARDUS PYNOCEPHAGUS, BRONNUS DIANDRUS, Avena, ETC.

ARID REGIONS - WETLAND DELINEATION DATA SHEET

Project: NASA - Santa Susana Field Lab Date: 1/5/2012Observers: Russell Huddleston and Steve LongFeature Name BELL CREEK - ALFA Sample Point CONCRETE IMPOUNDMENT - ~~D~~GPS Location: 34° 13' 58.837" 118° 41' 40.151"

Geomorphic Feature

<input type="checkbox"/> River	<input type="checkbox"/> Lake	<input type="checkbox"/> Swale
<input checked="" type="checkbox"/> Stream	<input type="checkbox"/> Pond	<input type="checkbox"/> Erosional Channel
<input type="checkbox"/> Canal	<input checked="" type="checkbox"/> Impoundment	<input type="checkbox"/> Gully
<input type="checkbox"/> Irrigation Channel	<input type="checkbox"/> Playa	<input type="checkbox"/> Depressional Basin
<input type="checkbox"/> Drainage Channel	<input type="checkbox"/> Constructed Basin	<input type="checkbox"/> Rock Basin
<input type="checkbox"/> Excavated Ditch	<input type="checkbox"/> Unvegetated Depression	<input type="checkbox"/> Other: _____

Apparent Hydrologic Regime

<input type="checkbox"/> Perennial	<input type="checkbox"/> Standing Water (Depth: _____)
<input type="checkbox"/> Intermittent	<input type="checkbox"/> Flowing Water (Depth: _____)
<input checked="" type="checkbox"/> Ephemeral	<input checked="" type="checkbox"/> Dry at time of the survey

Indicators

<input type="checkbox"/> Standing or flowing water with no indication of recent precipitation	<input type="checkbox"/> Channel adjacent to shelf with steep side	<input type="checkbox"/> Natural / irrigation / manmade / ditch flowing into feature
<input type="checkbox"/> presence of hydrophytic vegetation	<input type="checkbox"/> Natural line, stain or mineral (salt) deposit	<input type="checkbox"/> Dated picture / account showing / referring to identifiable features
<input type="checkbox"/> Presence of hydric soil with or without hydrophytic vegetation	<input type="checkbox"/> Litter, debris and or clay deposits	<input checked="" type="checkbox"/> Wetland symbol on map (presence of solid or dotted blue line, solid, shaded or stippled blue area on map)
<input type="checkbox"/> Absence of vegetation or interruption of upland vegetation	<input type="checkbox"/> Algae or alga mat	<input type="checkbox"/> Other (Specify)

Notes: SHOWN AS A BLUE LINE ON USGS TOPO FOR THE CALABASAS QUAD; NW1 (PSSC) FORESTED/SCRUB WETLAND; NHD STREAM

NO EVIDENCE OF RECENT OAHNM / FLOWS IN THIS AREA

Channel Characteristics

Channel Width	/ NO DEFINED BED/ BANK CHANNEL IN THIS AREA	
Channel Depth	~ 15' WIDE (NO MEASUREMENT TAKEN)	
High Water Line Width	~ 2 FEET TO TOP OF IMPOUNDMENT	
High Water Line Depth		
Channel Substrate (check all that apply)		
<input checked="" type="checkbox"/> Sand	<input type="checkbox"/> Cobble	<input type="checkbox"/> Silt / Clay
<input type="checkbox"/> Gravel	<input type="checkbox"/> Rock	<input type="checkbox"/> Other _____

Vegetation Characteristics of Channel or Basin

Vegetated Channel or Basin?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Dominant / Characteristic Species		
BACCHARIS SALICIFOLIA } FROM IMPOUNDMENT		
SALIX LASIOLEPIS - } BANK TO 24" CMP		
DISCHARGE		
- ABUNDANT UPLAND UNDERSTORY HERBS - WILLOWS		
IN POOR CONDITION - 85-90% DEAD IN SOME AREAS		

Vegetation Adjacent to Channel

Dominant / Characteristic Species
BACCHARIS FLULARIS, MARGONIA LAURINA,
AVENA BARBATA, CARDUUS PTEROCEPHALUS
CENTAUREA MELITENSIS
SMALL QUERCUS AGRIFOLIA

Notes: VERY WEAKLY EXPRESSED / INTERMITTENT DRAINAGE CHANNEL FROM CULVERT OUTFALL DOWN TO THE CONCRETE IMPOUNDMENT - MOSTLY NO DEFINED CHANNEL

TWO CULVERTS AT IMPOUNDMENT - ONE RUNS ALONG THE SOUTH - TOP SLOPE OF THE DRAINAGE - THE SECOND CULVERT APPEARS TO DISCHARGE INTO THE NATURAL CHANNEL ~15' BELOW THE IMPOUNDMENT STRUCTURE

ARID REGIONS - WETLAND DELINEATION DATA SHEET

Project: NASA - Santa Susana Field Lab Date: 1/5/2012Observers: Russell Huddleston and Steve LongFeature Name BELL CREEK - ALFA Sample Point DOWN STREAM CONCRETE IMPOUND. **BC-2**GPS Location: AVE POSITION: 34° 13' 58.906 118° 41' 40.784"

Geomorphic Feature

<input type="checkbox"/> River	<input type="checkbox"/> Lake	<input type="checkbox"/> Swale
<input checked="" type="checkbox"/> Stream	<input type="checkbox"/> Pond	<input type="checkbox"/> Erosional Channel
<input type="checkbox"/> Canal	<input checked="" type="checkbox"/> Impoundment	<input type="checkbox"/> Gully
<input type="checkbox"/> Irrigation Channel	<input type="checkbox"/> Playa	<input type="checkbox"/> Depressional Basin
<input type="checkbox"/> Drainage Channel	<input type="checkbox"/> Constructed Basin	<input type="checkbox"/> Rock Basin
<input type="checkbox"/> Excavated Ditch	<input type="checkbox"/> Unvegetated Depression	<input type="checkbox"/> Other: _____

Apparent Hydrologic Regime

<input type="checkbox"/> Perennial	<input type="checkbox"/> Standing Water (Depth: _____)
<input type="checkbox"/> Intermittent	<input type="checkbox"/> Flowing Water (Depth: _____)
<input checked="" type="checkbox"/> Ephemeral	<input checked="" type="checkbox"/> Dry at time of the survey

Indicators

<input type="checkbox"/> Standing or flowing water with no indication of recent precipitation	<input type="checkbox"/> Channel adjacent to shelf with steep side	<input type="checkbox"/> Natural / irrigation / manmade / ditch flowing into feature
<input type="checkbox"/> presence of hydrophytic vegetation	<input type="checkbox"/> Natural line, stain or mineral (salt) deposit	<input type="checkbox"/> Dated picture / account showing / referring to identifiable features
<input type="checkbox"/> Presence of hydric soil with or without hydrophytic vegetation	<input type="checkbox"/> Litter, debris and or clay deposits	<input checked="" type="checkbox"/> Wetland symbol on map (presence of solid or dotted blue line, solid, shaded or stippled blue area on map)
<input type="checkbox"/> Absence of vegetation or interruption of upland vegetation	<input type="checkbox"/> Algae or alga mat	<input type="checkbox"/> Other (Specify)

Notes: SHOWN AS A BLUE LINE ON THE USGS TOPO MAP FOR THE CALABASAS QUAD; NW1 (PSSC) FORESTED / SCRUB WETLAND AND NHD STREAM

- NO EVIDENCE OF RECENT FLOW IN THIS AREA

Channel Characteristics

Channel Width	NO DEFINED BED / BANK	
Channel Depth	CHANNEL PRESENT	
High Water Line Width		
High Water Line Depth		
Channel Substrate (check all that apply)		
<input checked="" type="checkbox"/> Sand	<input type="checkbox"/> Cobble	<input type="checkbox"/> Silt / Clay
<input type="checkbox"/> Gravel	<input type="checkbox"/> Rock	<input type="checkbox"/> Other _____

Vegetation Characteristics of Channel or Basin

Vegetated Channel or Basin?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Dominant / Characteristic Species		
CHANNEL THROUGHOUT THE AREA IS FILLED WITH		
DEAD / FALLEN WOODY DEBRIS - APPEARS MOSTLY		
SALIX LASIOREPERIS - BURNED IN 2005 FIRE		
ALMOST NO REGENERATION		
DENSE CARDUS PRINOCEPHALIS IN "CHANNEL"		

Vegetation Adjacent to Channel

Dominant / Characteristic Species
BACCHARIS PILULARIS
MAIOSOMA LAURINA
QUERCUS AGRIFFOLIA (FEW SMALL TREES)
SPARSE BACCHARIS SALICIFOLIA ALONG LOWER SLOPES
AVENA BARBATA, BRONUS STR CENTAUREA MELITENSIS

Notes: COULD NOT ACCESS THIS SECTION DUE TO
 ABUNDANT FALLEN WOODY DEBRIS - NO
 APPARENT BED / BANK FEATURE AND NO
 EVIDENCE OF RECENT FLOWS THROUGH
 THIS SECTION - DOWN STREAM TO EARTHEN DAM
 STRUCTURE

ARID REGIONS - WETLAND DELINEATION DATA SHEET

Project: NASA - Santa Susana Field Lab Date: 1/5/2012Observers: Russell Huddleston and Steve LongFeature Name BELL CREEK - ALFA Sample Point ^{DUMP STREAM} EARTHEN DAM BC-3GPS Location: 34° 13' 58.352" 118° 41' 43.905"

Geomorphic Feature

<input type="checkbox"/> River	<input type="checkbox"/> Lake	<input type="checkbox"/> Swale
<input checked="" type="checkbox"/> Stream	<input type="checkbox"/> Pond	<input type="checkbox"/> Erosional Channel
<input type="checkbox"/> Canal	<input checked="" type="checkbox"/> Impoundment	<input type="checkbox"/> Gully
<input type="checkbox"/> Irrigation Channel	<input type="checkbox"/> Playa	<input type="checkbox"/> Depressional Basin
<input type="checkbox"/> Drainage Channel	<input type="checkbox"/> Constructed Basin	<input type="checkbox"/> Rock Basin
<input type="checkbox"/> Excavated Ditch	<input type="checkbox"/> Unvegetated Depression	<input type="checkbox"/> Other: _____

Apparent Hydrologic Regime

<input type="checkbox"/> Perennial	<input type="checkbox"/> Standing Water (Depth: _____)
<input type="checkbox"/> Intermittent	<input type="checkbox"/> Flowing Water (Depth: _____)
<input checked="" type="checkbox"/> Ephemeral	<input checked="" type="checkbox"/> Dry at time of the survey

Indicators

<input type="checkbox"/> Standing or flowing water with no indication of recent precipitation	<input type="checkbox"/> Channel adjacent to shelf with steep side	<input type="checkbox"/> Natural / irrigation / manmade / ditch flowing into feature
<input type="checkbox"/> presence of hydrophytic vegetation	<input type="checkbox"/> Natural line, stain or mineral (salt) deposit	<input type="checkbox"/> Dated picture / account showing / referring to identifiable features
<input type="checkbox"/> Presence of hydric soil with or without hydrophytic vegetation	<input type="checkbox"/> Litter, debris and or clay deposits	<input checked="" type="checkbox"/> Wetland symbol on map (presence of solid or dotted blue line, solid, shaded or stippled blue area on map)
<input type="checkbox"/> Absence of vegetation or interruption of upland vegetation	<input type="checkbox"/> Algae or alga mat	<input type="checkbox"/> Other (Specify)

Notes: SHOWN AS A BLUE LINE ON THE USGS TOPO MAP FOR THE CALABASAS QUAD; NW1 (PSSC) FORESTED/SHRUB WETLAND; NHD STREAM

NO EVIDENCE OF RECENT FLOW OR CHANNEL IN THIS AREA

Channel Characteristics

Channel Width	NO DEFINED BED-BANK
Channel Depth	FEATURE IN THIS AREA
High Water Line Width	DOWN STREAM OF EARTHEN
High Water Line Depth	DAM
Channel Substrate (check all that apply)	
<input checked="" type="checkbox"/> Sand	<input type="checkbox"/> Cobble
<input type="checkbox"/> Gravel	<input type="checkbox"/> Rock
	<input type="checkbox"/> Silt / Clay
	<input type="checkbox"/> Other _____

Vegetation Characteristics of Channel or Basin

Vegetated Channel or Basin?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Dominant / Characteristic Species		
BACCHARIS SALICIFOLIA		
TOXICODENDRON DIVERSILOBUM		
CARPUS PYCNOCEPHALUS		

Vegetation Adjacent to Channel

Dominant / Characteristic Species	
BRASSICA NIGRA, CENTAUREA MELATENSIS, BROMUS SPP.	
*ARTEMESIA CALIFORNICA	
ERIOGONUM FASCICULATUM	
BACCHARIS PILULARIS	} SPARSE, SCATTERED SHRUBS
MACROTHAMNUS FASCICULATUS	
MACOSOMA LAURINA	

Notes:

DOWN STREAM NO DEFINED CHANNEL - NO BED BANK
 FLAT TOPOGRAPHY BETWEEN SLOPES - NO EVIDENCE
 OF RECENT FLOW - VEGETATION BACCHARIS PILULARIS,
 BACCHARIS SALICIFOLIA, DEAD SAMX LASIOLEPIS - ABUNDANT
 CARPUS PYCNOCEPHALUS, TOXICODENDRON DIVERSILOBUM
 AND BRASSICA NIGRA

*NO CULVERT WAS LOCATED AT THE WEST END
 NEAR THE ROAD

ARID REGIONS - WETLAND DELINEATION DATA SHEET

Project: NASA - Santa Susana Field Lab Date: 1/5/2012Observers: Russell Huddleston and Steve LongFeature Name BELL CREEK - ALFA Sample Point WEST ^{DOWN STREAM OF CAPPED POND}GPS Location: Ave position: 34° 13' 58.550" 118° 41' 57.006"

BC-4

Geomorphic Feature

<input type="checkbox"/> River	<input type="checkbox"/> Lake	<input type="checkbox"/> Swale
<input checked="" type="checkbox"/> Stream	<input type="checkbox"/> Pond	<input type="checkbox"/> Erosional Channel
<input type="checkbox"/> Canal	<input type="checkbox"/> Impoundment	<input type="checkbox"/> Gully
<input type="checkbox"/> Irrigation Channel	<input type="checkbox"/> Playa	<input type="checkbox"/> Depressional Basin
<input type="checkbox"/> Drainage Channel	<input type="checkbox"/> Constructed Basin	<input type="checkbox"/> Rock Basin
<input type="checkbox"/> Excavated Ditch	<input type="checkbox"/> Unvegetated Depression	<input type="checkbox"/> Other: _____

Apparent Hydrologic Regime

<input type="checkbox"/> Perennial	<input type="checkbox"/> Standing Water (Depth: _____)
<input type="checkbox"/> Intermittent	<input type="checkbox"/> Flowing Water (Depth: _____)
<input checked="" type="checkbox"/> Ephemeral	<input checked="" type="checkbox"/> Dry at time of the survey

Indicators

<input type="checkbox"/> Standing or flowing water with no indication of recent precipitation	<input type="checkbox"/> Channel adjacent to shelf with steep side	<input type="checkbox"/> Natural / irrigation / manmade / ditch flowing into feature
<input type="checkbox"/> presence of hydrophytic vegetation	<input type="checkbox"/> Natural line, stain or mineral (salt) deposit	<input type="checkbox"/> Dated picture / account showing / referring to identifiable features
<input type="checkbox"/> Presence of hydric soil with or without hydrophytic vegetation	<input type="checkbox"/> Litter, debris and or clay deposits	<input checked="" type="checkbox"/> Wetland symbol on map (presence of solid or dotted blue line, solid, shaded or stippled blue area on map)
<input type="checkbox"/> Absence of vegetation or interruption of upland vegetation	<input type="checkbox"/> Algae or alga mat	<input type="checkbox"/> Other (Specify)

Notes: BLUE LINE ON USGS TOPO MAP FOR THE CRABASAS QUAD; NHD STREAM; NO NWI FEATURE

NO EVIDENCE OF RECENT FLOW

Channel Characteristics

Channel Width	NO DEFINED CHANNEL	
Channel Depth	OR BED-BANK IN THIS	
High Water Line Width	AREA	
High Water Line Depth		
Channel Substrate (check all that apply)		
<input checked="" type="checkbox"/> Sand	<input type="checkbox"/> Cobble	<input type="checkbox"/> Silt / Clay
<input type="checkbox"/> Gravel	<input type="checkbox"/> Rock	<input type="checkbox"/> Other _____

Vegetation Characteristics of Channel or Basin

Vegetated Channel or Basin?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Dominant / Characteristic Species		
BACCHARIS SALICIFOLIA		
CARDUUS PYNOCEPHALUS		
BACCHARIS PILULARIS		
TOXICODENDRON DIVERSILOBUM		
PHACALIEA RAMOSISSIMA		

Vegetation Adjacent to Channel

Dominant / Characteristic Species

Notes: TERMINATES AT 50 INCH DIAM CMP TUST
BEFORE SPA AREA - (UNDER ROAD)

UPSTREAM OF CULVERT - SOME SALIX LASIOLEPIS,
ARTEMESIA DOUBLASIANA WITH MALACOTHAMNUS
FASCICULATUS, BACCHARIS SALICIFOLIA - INTERMITTENT
2 FOOT WIDE 2-3 INCH DEEP EROSIONAL CHANNEL BUT
NO CHENM OR CONTINUOUS BED / BANK FEATURE
IN THIS AREA.

ARID REGIONS - WETLAND DELINEATION DATA SHEET

Project: NASA - Santa Susana Field Lab Date: 1/5/2012Observers: Russell Huddleston and Steve LongFeature Name BELL CREEK - SPASample Point (CONCRETE LINED) ~~SPA~~GPS Location: ~~AVE POSITION: 34° 14' 01.234" 118° 42' 01.249"~~34° 14' 01.469"118° 42' 03.118"

Geomorphic Feature

<input type="checkbox"/> River	<input type="checkbox"/> Lake	<input type="checkbox"/> Swale
<input checked="" type="checkbox"/> Stream	<input type="checkbox"/> Pond	<input type="checkbox"/> Erosional Channel
<input type="checkbox"/> Canal	<input type="checkbox"/> Impoundment	<input type="checkbox"/> Gully
<input type="checkbox"/> Irrigation Channel	<input type="checkbox"/> Playa	<input type="checkbox"/> Depressional Basin
<input type="checkbox"/> Drainage Channel	<input type="checkbox"/> Constructed Basin	<input type="checkbox"/> Rock Basin
<input type="checkbox"/> Excavated Ditch	<input type="checkbox"/> Unvegetated Depression	<input type="checkbox"/> Other: _____

Apparent Hydrologic Regime

<input type="checkbox"/> Perennial	<input type="checkbox"/> Standing Water (Depth: _____)
<input type="checkbox"/> Intermittent	<input type="checkbox"/> Flowing Water (Depth: _____)
<input checked="" type="checkbox"/> Ephemeral	<input checked="" type="checkbox"/> Dry at time of the survey

Indicators

<input type="checkbox"/> Standing or flowing water with no indication of recent precipitation	<input type="checkbox"/> Channel adjacent to shelf with steep side	<input type="checkbox"/> Natural / irrigation / manmade / ditch flowing into feature
<input type="checkbox"/> presence of hydrophytic vegetation	<input checked="" type="checkbox"/> Natural line, stain or mineral (salt) deposit	<input type="checkbox"/> Dated picture / account showing / referring to identifiable features
<input type="checkbox"/> Presence of hydric soil with or without hydrophytic vegetation	<input type="checkbox"/> Litter, debris and or clay deposits	<input checked="" type="checkbox"/> Wetland symbol on map (presence of solid or dotted blue line, solid, shaded or stippled blue area on map)
<input type="checkbox"/> Absence of vegetation or interruption of upland vegetation	<input type="checkbox"/> Algae or alga mat	<input type="checkbox"/> Other (Specify)

Notes: SHOWN AS A BLUE LINE ON THE USGS TOPO MAP FOR THE CALABASAS QUAD; NHD STREAM - WESTERN PART OF THIS FEATURE SHOWN AS NWI - (PFOA) FORESTED / SCRUB WETLAND

- SOME WATER STAINING ON CONCRETE

Channel Characteristics

CONCRETE LINED DRAINAGE DITCH

Channel Width	5.7 FT - 10.8 FT
Channel Depth	25 INCHES
High Water Line Width	1 - 3 FEET
High Water Line Depth	2 INCHES
Channel Substrate (check all that apply)	
<input type="checkbox"/> Sand	<input type="checkbox"/> Cobble
<input type="checkbox"/> Gravel	<input type="checkbox"/> Rock
<input type="checkbox"/> Silt / Clay	<input checked="" type="checkbox"/> Other <u>CONCRETE</u>

Vegetation Characteristics of Channel or Basin

Vegetated Channel or Basin?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Dominant / Characteristic Species		

Vegetation Adjacent to Channel

Dominant / Characteristic Species
MILIOSOMA LAURINA, ERIODICTION CRASSIFOLIUM
BACCHARIS PILULARIS, BACCHARIS SACRIFICOLIA
TOXICODENDRON DIVERSILOBUM, RIBES MALVACEUM,
ADENOSTOMA FASCICULATUM, CEANOTHUS CRASSIFOLIUS

Notes: CONCRETE CHANNEL ENDS APPROX 100 FEET
DOWN STREAM OF THIS LOCATION

ARID REGIONS - WETLAND DELINEATION DATA SHEET

Project: NASA - Santa Susana Field Lab Date: 11/5/2012Observers: Russell Huddleston and Steve LongFeature Name BELL CREEK - SPA Sample Point ~~SP-6~~ BC-6GPS Location: 34° 14' 00.432 118° 42' 07.570

Geomorphic Feature

<input type="checkbox"/> River	<input type="checkbox"/> Lake	<input type="checkbox"/> Swale
<input checked="" type="checkbox"/> Stream	<input type="checkbox"/> Pond	<input type="checkbox"/> Erosional Channel
<input type="checkbox"/> Canal	<input type="checkbox"/> Impoundment	<input type="checkbox"/> Gully
<input type="checkbox"/> Irrigation Channel	<input type="checkbox"/> Playa	<input type="checkbox"/> Depressional Basin
<input type="checkbox"/> Drainage Channel	<input type="checkbox"/> Constructed Basin	<input type="checkbox"/> Rock Basin
<input type="checkbox"/> Excavated Ditch	<input type="checkbox"/> Unvegetated Depression	<input type="checkbox"/> Other: _____

Apparent Hydrologic Regime

<input type="checkbox"/> Perennial	<input type="checkbox"/> Standing Water (Depth: _____)
<input type="checkbox"/> Intermittent	<input type="checkbox"/> Flowing Water (Depth: _____)
<input checked="" type="checkbox"/> Ephemeral	<input checked="" type="checkbox"/> Dry at time of the survey

Indicators

<input type="checkbox"/> Standing or flowing water with no indication of recent precipitation	<input type="checkbox"/> Channel adjacent to shelf with steep side	<input type="checkbox"/> Natural / irrigation / manmade / ditch flowing into feature
<input type="checkbox"/> presence of hydrophytic vegetation	<input type="checkbox"/> Natural line, stain or mineral (salt) deposit	<input type="checkbox"/> Dated picture / account showing / referring to identifiable features
<input type="checkbox"/> Presence of hydric soil with or without hydrophytic vegetation	<input checked="" type="checkbox"/> Litter, debris and or clay deposits	<input checked="" type="checkbox"/> Wetland symbol on map (presence of solid or dotted blue line, solid, shaded or stippled blue area on map)
<input type="checkbox"/> Absence of vegetation or interruption of upland vegetation	<input type="checkbox"/> Algae or alga mat	<input checked="" type="checkbox"/> Other (Specify) <u>SCARPING</u>

Notes: SHOWN AS BLUE LINE ON USGS TOPO MAP FOR THE CALABASAS QUAD, NHD STREAM; NW1 (PFOA) - FORESTED / SHARP WETLAND

Channel Characteristics

Channel Width	6 FT	
Channel Depth	2 FT	
High Water Line Width	2.7 FT	
High Water Line Depth	4 INCHES	
Channel Substrate (check all that apply)		
<input checked="" type="checkbox"/> Sand	<input type="checkbox"/> Cobble	<input type="checkbox"/> Silt / Clay
<input checked="" type="checkbox"/> Gravel	<input checked="" type="checkbox"/> Rock	<input type="checkbox"/> Other _____
SAND / ROCK CHANNEL W/ SPARSE GRAVEL		

Vegetation Characteristics of Channel or Basin

Vegetated Channel or Basin?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Dominant / Characteristic Species		
CARDUUS PYCNOCEPHALUS SEEDLINGS } LESS THAN 1% TOTAL		
POLYPOGON MONSPELIENSIS } COVER		

Vegetation Adjacent to Channel

Dominant / Characteristic Species
BACCHARIS SALICIFOLIA, BACCHARIS PILULARIS
DEAD SALIX SP - NO REGENERATION - BURNED IN 2005 FIRE
MALACOTHAMNUS FASCICULATUS
CARDUUS PYCNOCEPHALUS, BRASSICA NIGRA

Notes: DOWN STREAM OF CONCRETE LINED DITCH - CONTINUES
 BE GENERALLY SOUTH INTO SILVERNALE POND OFF
 NASA PROPERTY

ARID REGIONS - WETLAND DELINEATION DATA SHEET

Project: NASA - Santa Susana Field Lab Date: 1/6/2012Observers: Russell Huddleston and Steve LongFeature Name BELL CREEK - CDFP Sample Point ~~924~~ BC-7GPS Location: 34° 13' 41.161" 118° 42' 25.275"

Geomorphic Feature

<input type="checkbox"/> River	<input type="checkbox"/> Lake	<input type="checkbox"/> Swale
<input checked="" type="checkbox"/> Stream	<input type="checkbox"/> Pond	<input type="checkbox"/> Erosional Channel
<input type="checkbox"/> Canal	<input type="checkbox"/> Impoundment	<input type="checkbox"/> Gully
<input type="checkbox"/> Irrigation Channel	<input type="checkbox"/> Playa	<input type="checkbox"/> Depressional Basin
<input type="checkbox"/> Drainage Channel	<input type="checkbox"/> Constructed Basin	<input type="checkbox"/> Rock Basin
<input type="checkbox"/> Excavated Ditch	<input type="checkbox"/> Unvegetated Depression	<input type="checkbox"/> Other: _____

Apparent Hydrologic Regime

<input type="checkbox"/> Perennial	<input type="checkbox"/> Standing Water (Depth: _____)
<input type="checkbox"/> Intermittent	<input type="checkbox"/> Flowing Water (Depth: _____)
<input checked="" type="checkbox"/> Ephemeral	<input checked="" type="checkbox"/> Dry at time of the survey

Indicators

<input type="checkbox"/> Standing or flowing water with no indication of recent precipitation	<input type="checkbox"/> Channel adjacent to shelf with steep side	<input type="checkbox"/> Natural / irrigation / manmade / ditch flowing into feature
<input type="checkbox"/> presence of hydrophytic vegetation	<input type="checkbox"/> Natural line, stain or mineral (salt) deposit	<input type="checkbox"/> Dated picture / account showing / referring to identifiable features
<input type="checkbox"/> Presence of hydric soil with or without hydrophytic vegetation	<input type="checkbox"/> Litter, debris and or clay deposits	<input checked="" type="checkbox"/> Wetland symbol on map (presence of solid or dotted blue line, solid, shaded or stippled blue area on map)
<input type="checkbox"/> Absence of vegetation or interruption of upland vegetation	<input type="checkbox"/> Algae or alga mat	<input type="checkbox"/> Other (Specify)

Notes: SHOWN AS A BLUE LINE STREAM ON USGS TOPO MAP FOR THE CALABASAS QUAD; ALSO SHOWN AS A NHD STREAM - NO NWI MAPPED FEATURES THIS AREA

Channel Characteristics

Channel Width	5 FT
Channel Depth	1 FT
High Water Line Width	30 INCHES
High Water Line Depth	1-2 INCHES
Channel Substrate (check all that apply)	
<input checked="" type="checkbox"/> Sand	<input type="checkbox"/> Cobble
<input checked="" type="checkbox"/> Gravel	<input type="checkbox"/> Rock
	<input type="checkbox"/> Silt / Clay
	<input type="checkbox"/> Other _____
SANDY W/ SPARSE GRAVEL -- MORE COBBLE DOWN STREAM	

Vegetation Characteristics of Channel or Basin

Vegetated Channel or Basin?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Dominant / Characteristic Species		
CARDUUS PYCNOCEPHALUS		
BRASSICA NIGRA		
SILYBUM MARIANUM		
LESS THAN 2% TOTAL COVER		

Vegetation Adjacent to Channel

Dominant / Characteristic Species
BACCHARIS SALICIFOLIA, ADENOSTEMA FASCICULATA,
ERIODICTYON CRASSIFOLIUM, Ceanothus SP., MALOSOMA LAURINA
SOME QUERCUS AGRIFOLIA - SALIX LASIOLEPIS SAPINDUS
PHACELIA RAMOSISSIMA, BRASSICA NIGRA

Notes: _____

ARID REGIONS - WETLAND DELINEATION DATA SHEET

Project: NASA - Santa Susana Field Lab Date: 1/6/2012Observers: Russell Huddleston and Steve LongFeature Name BELL CREEK - CDFF Sample Point ~~57~~ 13C-8GPS Location: 34° 13' 39.469" -118° 42' 25.316"

Geomorphic Feature

<input type="checkbox"/> River	<input type="checkbox"/> Lake	<input type="checkbox"/> Swale
<input checked="" type="checkbox"/> Stream	<input type="checkbox"/> Pond	<input type="checkbox"/> Erosional Channel
<input type="checkbox"/> Canal	<input type="checkbox"/> Impoundment	<input type="checkbox"/> Gully
<input type="checkbox"/> Irrigation Channel	<input type="checkbox"/> Playa	<input type="checkbox"/> Depressional Basin
<input type="checkbox"/> Drainage Channel	<input type="checkbox"/> Constructed Basin	<input type="checkbox"/> Rock Basin
<input type="checkbox"/> Excavated Ditch	<input type="checkbox"/> Unvegetated Depression	<input type="checkbox"/> Other: _____

Apparent Hydrologic Regime

<input type="checkbox"/> Perennial	<input type="checkbox"/> Standing Water (Depth: _____)
<input type="checkbox"/> Intermittent	<input type="checkbox"/> Flowing Water (Depth: _____)
<input checked="" type="checkbox"/> Ephemeral	<input checked="" type="checkbox"/> Dry at time of the survey

Indicators

<input type="checkbox"/> Standing or flowing water with no indication of recent precipitation	<input type="checkbox"/> Channel adjacent to shelf with steep side	<input type="checkbox"/> Natural / irrigation / manmade / ditch flowing into feature
<input type="checkbox"/> presence of hydrophytic vegetation	<input type="checkbox"/> Natural line, stain or mineral (salt) deposit	<input type="checkbox"/> Dated picture / account showing / referring to identifiable features
<input type="checkbox"/> Presence of hydric soil with or without hydrophytic vegetation	<input type="checkbox"/> Litter, debris and or clay deposits	<input checked="" type="checkbox"/> Wetland symbol on map (presence of solid or dotted blue line, solid, shaded or stippled blue area on map)
<input type="checkbox"/> Absence of vegetation or interruption of upland vegetation	<input type="checkbox"/> Algae or alga mat	<input type="checkbox"/> Other (Specify)

Notes: SHOWN AS A BLUE LINE ON THE USGS TOPO MAP FOR THE CALABASAS QUAD; NHD STREAM NO NWI MAPPED WETLANDS

Channel Characteristics

Channel Width	4.8 FT
Channel Depth	8-18 INCHES
High Water Line Width	2.1 FT
High Water Line Depth	3 INCHES
Channel Substrate (check all that apply)	
<input checked="" type="checkbox"/> Sand	<input checked="" type="checkbox"/> Cobble
<input checked="" type="checkbox"/> Gravel	<input type="checkbox"/> Rock
<input type="checkbox"/> Silt / Clay	<input type="checkbox"/> Other _____
SAND / GRAVEL SUBSTRATE W/ SPARSE COBBLE	

Vegetation Characteristics of Channel or Basin

Vegetated Channel or Basin?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Dominant / Characteristic Species		
BRASSICA NIGRA } LESS THAN 5% TOTAL		
CARDUUS PYNOCEPHALUS } COVER		

Vegetation Adjacent to Channel

Dominant / Characteristic Species
ARTEMESIA DOUGLASIANA, TOXICODENDRON DIVERSILOBUM
ERIODICTYON CRASSIFOLIUM, BACCHARIS SAUCIFOLIA,
MALACOTHAMNUS FASCICULATUS, Ceanothus sp.
BRASSICA NIGRA, PHACELIA RAMOSISSIMA, BACCHARIS PILULARIS
SILYBUM MARIANUM - OCCASSIONAL SALIX LASIOLEPIS - 4" DBH

Notes:

DOWN STREAM - WELL DEFINED SANDY CHANNEL
 FLOWS THROUGH AREA WITH DENSE ARTEMESIA
 DOUGLASIANA WITH SCATTERED BRASSICA NIGRA
 - SURROUNDED BY BACCHARIS PILULARIS, TOXICODENDRON
 DIVERSILOBUM - OCCASSIONAL QUERCUS AGRIFOLIA
 - SEGMENT NORTH OF R2B POND DENSE TOXICODENDRON
 NO ACCESS TO THE DRAINAGE

ARID REGIONS - WETLAND DELINEATION DATA SHEET

Project: NASA - Santa Susana Field Lab Date: 1/5/2012Observers: Russell Huddleston and Steve LongFeature Name BELL CREEK SW Sample Point ~~3A~~ BC-9GPS Location: 34° 13' 33.868" 118° 42' 23.679"

Geomorphic Feature

<input type="checkbox"/> River	<input type="checkbox"/> Lake	<input type="checkbox"/> Swale
<input checked="" type="checkbox"/> Stream	<input type="checkbox"/> Pond	<input type="checkbox"/> Erosional Channel
<input type="checkbox"/> Canal	<input type="checkbox"/> Impoundment	<input type="checkbox"/> Gully
<input type="checkbox"/> Irrigation Channel	<input type="checkbox"/> Playa	<input type="checkbox"/> Depressional Basin
<input type="checkbox"/> Drainage Channel	<input type="checkbox"/> Constructed Basin	<input type="checkbox"/> Rock Basin
<input type="checkbox"/> Excavated Ditch	<input type="checkbox"/> Unvegetated Depression	<input type="checkbox"/> Other: _____

Apparent Hydrologic Regime

<input type="checkbox"/> Perennial	<input type="checkbox"/> Standing Water (Depth: _____)
<input type="checkbox"/> Intermittent	<input type="checkbox"/> Flowing Water (Depth: _____)
<input checked="" type="checkbox"/> Ephemeral	<input checked="" type="checkbox"/> Dry at time of the survey
<u>HYDROLOGY MANAGED - PUMPING TO SILVERNALE POND</u>	

Indicators

<input type="checkbox"/> Standing or flowing water with no indication of recent precipitation	<input type="checkbox"/> Channel adjacent to shelf with steep side	<input type="checkbox"/> Natural / irrigation / manmade / ditch flowing into feature
<input type="checkbox"/> presence of hydrophytic vegetation	<input type="checkbox"/> Natural line, stain or mineral (salt) deposit	<input type="checkbox"/> Dated picture / account showing / referring to identifiable features
<input type="checkbox"/> Presence of hydric soil with or without hydrophytic vegetation	<input checked="" type="checkbox"/> Litter, debris and or clay deposits	<input checked="" type="checkbox"/> Wetland symbol on map (presence of solid or dotted blue line, solid, shaded or stippled blue area on map)
<input type="checkbox"/> Absence of vegetation or interruption of upland vegetation	<input type="checkbox"/> Algae or alga mat	<input type="checkbox"/> Other (Specify)

Notes: - SHOWN AS BLUE LINE ON USGS TOPO FOR THE CALABASAS QUAD; NWI (PFOA) FORESTED/SCRUB WETLAND AND NHD STREAM.

SOME OLD DRIFT LINES / DEBRIS WRACKING EVIDENT

Channel Characteristics

Channel Width	10 FT
Channel Depth	14 INCHES
High Water Line Width <small>LOW FLOW</small>	3.7 FT
High Water Line Depth <small>LOW FLOW</small>	4 INCHES
Channel Substrate (check all that apply)	
<input checked="" type="checkbox"/> Sand	<input checked="" type="checkbox"/> Cobble
<input checked="" type="checkbox"/> Gravel	<input type="checkbox"/> Rock
<input type="checkbox"/> Silt / Clay	
<input checked="" type="checkbox"/> Other <u>Boulders</u>	
SAND-GRAVEL - COBBLE SUBSTRATE W/ SOME LARGE SANDSTONE BOULDERS	

Vegetation Characteristics of Channel or Basin

Vegetated Channel or Basin?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Dominant / Characteristic Species		

Vegetation Adjacent to Channel

Dominant / Characteristic Species
BACCHARIS SALICIFOLIA
BACCHARIS PILULARIS
TOXICODENDRON DIVERSILOBUM, QUERCUS AGRIFFOLIA
ERICIDICTION CRASSIFOLIUM, MALOSOMA LAURINA
PIPTATHERUM MILACEUM, PHAELIA RAMOSISSIMA
Viburnum RIBES MALVACEUM

Notes:

DENSE BACCHARIS SALICIFOLIA OVERHANGING THE CHANNEL THROUGHOUT MUCH OF THIS AREA BUT BOTTOM OF CHANNEL GENERALLY DEVOID OF VEGETATION

ARID REGIONS - WETLAND DELINEATION DATA SHEET

Project: NASA - Santa Susana Field Lab Date: 1/5/2012Observers: Russell Huddleston and Steve LongFeature Name BELL CREEK SW Sample Point ~~ST-10~~ ~~BC-10~~GPS Location: 34° 13' 32.724" -118° 42' 25.084 BC-10

Geomorphic Feature

<input type="checkbox"/> River	<input type="checkbox"/> Lake	<input type="checkbox"/> Swale
<input checked="" type="checkbox"/> Stream	<input type="checkbox"/> Pond	<input type="checkbox"/> Erosional Channel
<input type="checkbox"/> Canal	<input type="checkbox"/> Impoundment	<input type="checkbox"/> Gully
<input type="checkbox"/> Irrigation Channel	<input type="checkbox"/> Playa	<input type="checkbox"/> Depressional Basin
<input type="checkbox"/> Drainage Channel	<input type="checkbox"/> Constructed Basin	<input type="checkbox"/> Rock Basin
<input type="checkbox"/> Excavated Ditch	<input type="checkbox"/> Unvegetated Depression	<input type="checkbox"/> Other: _____

Apparent Hydrologic Regime

<input type="checkbox"/> Perennial	<input type="checkbox"/> Standing Water (Depth: _____)
<input type="checkbox"/> Intermittent	<input type="checkbox"/> Flowing Water (Depth: _____)
<input checked="" type="checkbox"/> Ephemeral	<input checked="" type="checkbox"/> Dry at time of the survey

MANAGED HYDROLOGY - PUMPING INTO SILVERNAVE POND

Indicators

<input type="checkbox"/> Standing or flowing water with no indication of recent precipitation	<input type="checkbox"/> Channel adjacent to shelf with steep side	<input type="checkbox"/> Natural / irrigation / manmade / ditch flowing into feature
<input type="checkbox"/> presence of hydrophytic vegetation	<input type="checkbox"/> Natural line, stain or mineral (salt) deposit	<input type="checkbox"/> Dated picture / account showing / referring to identifiable features
<input type="checkbox"/> Presence of hydric soil with or without hydrophytic vegetation	<input checked="" type="checkbox"/> Litter, debris and or clay deposits	<input checked="" type="checkbox"/> Wetland symbol on map (presence of solid or dotted blue line, solid, shaded or stippled blue area on map)
<input type="checkbox"/> Absence of vegetation or interruption of upland vegetation	<input type="checkbox"/> Algae or alga mat	<input type="checkbox"/> Other (Specify)

Notes: SHOWN AS A BLUE LINE STREAM ON THE 1969 CALABASAS TOPO MAP - NW1 (PFOA) FORESTED/SCRUB WETLAND AND NHD STREAM

- SOME DRIFT / DEBRIS AND WRACK LINES EVIDENCE OF PAST FLOWS

Channel Characteristics

Channel Width	10.5 FT
Channel Depth	1 FT
High Water Line Width <small>LOW FLOW</small>	5.75 FT
High Water Line Depth <small>LOW FLOW</small>	2"
Channel Substrate (check all that apply)	
<input type="checkbox"/> Sand	<input checked="" type="checkbox"/> Cobble
<input checked="" type="checkbox"/> Gravel	<input type="checkbox"/> Rock
	<input type="checkbox"/> Silt / Clay
	<input checked="" type="checkbox"/> Other <u>BOULDER</u>
COBBLE / GRAVEL W/ SOME SANDSTONE BOULDERS	

Vegetation Characteristics of Channel or Basin

Vegetated Channel or Basin?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Dominant / Characteristic Species		

Vegetation Adjacent to Channel

Dominant / Characteristic Species
QUERCUS AGRIFOLIA
BACCHARIS PILULARIS, KECKIELLA CORDIFOLIA,
MACOSOMA LAURINA, BACCHARIS SAILIFOLIA, Ceanothus SP.
ARTEMESIA DOUGLASIANA, TOXICODENDRON DIVERSILOBUM,
PHACALEIA RAMOSISSIMA
WATER

Notes: APPROX 45 FEET DOWNSTREAM OF THIS POINT
THE DRAINAGE IS BLOCKED BY LARGE SANDSTONE
BOULDERS AND DENSE TOXICODENDRON - COULD
NOT ACCESS THIS SECTION OF THE CREEK

-WATER FLOWS AROUND / UNDER BOULDERS THIS
SECTION

ARID REGIONS - WETLAND DELINEATION DATA SHEET

Project: NASA - Santa Susana Field Lab Date: 1/5/2012Observers: Russell Huddleston and Steve LongFeature Name BELL CREEK SW Sample Point ~~ST-3~~ BC-11GPS Location: 34° 13' 30.874" 118° 42' 28.210"

Geomorphic Feature

<input type="checkbox"/> River	<input type="checkbox"/> Lake	<input type="checkbox"/> Swale
<input checked="" type="checkbox"/> Stream	<input type="checkbox"/> Pond	<input type="checkbox"/> Erosional Channel
<input type="checkbox"/> Canal	<input type="checkbox"/> Impoundment	<input type="checkbox"/> Gully
<input type="checkbox"/> Irrigation Channel	<input type="checkbox"/> Playa	<input type="checkbox"/> Depressional Basin
<input type="checkbox"/> Drainage Channel	<input type="checkbox"/> Constructed Basin	<input type="checkbox"/> Rock Basin
<input type="checkbox"/> Excavated Ditch	<input type="checkbox"/> Unvegetated Depression	<input type="checkbox"/> Other: _____

Apparent Hydrologic Regime

<input type="checkbox"/> Perennial	<input type="checkbox"/> Standing Water (Depth: _____)
<input type="checkbox"/> Intermittent	<input type="checkbox"/> Flowing Water (Depth: _____)
<input checked="" type="checkbox"/> Ephemeral	<input checked="" type="checkbox"/> Dry at time of the survey

MANAGED HYDROLOGY - PUMPING TO SILVERMALE POND

Indicators

<input type="checkbox"/> Standing or flowing water with no indication of recent precipitation	<input type="checkbox"/> Channel adjacent to shelf with steep side	<input type="checkbox"/> Natural / irrigation / manmade / ditch flowing into feature
<input type="checkbox"/> presence of hydrophytic vegetation	<input type="checkbox"/> Natural line, stain or mineral (salt) deposit	<input type="checkbox"/> Dated picture / account showing / referring to identifiable features
<input type="checkbox"/> Presence of hydric soil with or without hydrophytic vegetation	<input type="checkbox"/> Litter, debris and or clay deposits	<input checked="" type="checkbox"/> Wetland symbol on map (presence of solid or dotted blue line, solid, shaded or stippled blue area on map)
<input type="checkbox"/> Absence of vegetation or interruption of upland vegetation	<input type="checkbox"/> Algae or alga mat	<input type="checkbox"/> Other (Specify)

Notes: SHOWN AS BLUE LINE ON USGS TOPO MAP FOR THE CALABASAS QUAD; NW1 (PFOA) FORESTED/SCRUB WETLAND; NHD STREAM

- NO EVIDENCE OF RECENT FLOWS OBSERVED AT THIS LOCATION

Channel Characteristics

Channel Width	9.7 FT
Channel Depth	18 INCHES
High Water Line Width <small>Low Flow</small>	4 FT
High Water Line Depth <small>Low Flow</small>	5 INCHES
Channel Substrate (check all that apply)	
<input checked="" type="checkbox"/> Sand	<input checked="" type="checkbox"/> Cobble
<input type="checkbox"/> Gravel	<input checked="" type="checkbox"/> Rock
<input type="checkbox"/> Silt / Clay	<input checked="" type="checkbox"/> Other <u>BOULDER</u>

Vegetation Characteristics of Channel or Basin

Vegetated Channel or Basin?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Dominant / Characteristic Species		
ARTEMESIA DOUGLASIANA		
RUMEX CRISPUS		
PIPTATHERUM MILACEUM		
CARDUUS PYCNOCEPHALUS		
LESS THAN 5% TOTAL COVER		

Vegetation Adjacent to Channel

Dominant / Characteristic Species
TOXICODENDRON DIVERSILOBUM, QUERCUS AGRIIFOLIA
SALIX LASIOLEPIS (FALLEN TREE w/ SMALL RESPROUTING BRANCHES)
MIMULUS AURANTIACUS, ARTEMESIA DOUGLASIANA,
PIPTATHERUM MILACEUM, RIBES MALVACEUM
PHACELIA RAMOSISSIMA

Notes:

ARID REGIONS - WETLAND DELINEATION DATA SHEET

Project: NASA - Santa Susana Field Lab Date: 1/5/2012Observers: Russell Huddleston and Steve LongFeature Name BELL CREEK SW Sample Point ~~SP-4~~ BC-12GPS Location: 34° 13' 28.989" 118° 42' 28.628"

Geomorphic Feature

<input type="checkbox"/> River	<input type="checkbox"/> Lake	<input type="checkbox"/> Swale
<input checked="" type="checkbox"/> Stream	<input type="checkbox"/> Pond	<input type="checkbox"/> Erosional Channel
<input type="checkbox"/> Canal	<input type="checkbox"/> Impoundment	<input type="checkbox"/> Gully
<input type="checkbox"/> Irrigation Channel	<input type="checkbox"/> Playa	<input type="checkbox"/> Depressional Basin
<input type="checkbox"/> Drainage Channel	<input type="checkbox"/> Constructed Basin	<input type="checkbox"/> Rock Basin
<input type="checkbox"/> Excavated Ditch	<input type="checkbox"/> Unvegetated Depression	<input type="checkbox"/> Other: _____

Apparent Hydrologic Regime

<input type="checkbox"/> Perennial	<input type="checkbox"/> Standing Water (Depth: _____)
<input type="checkbox"/> Intermittent	<input type="checkbox"/> Flowing Water (Depth: _____)
<input checked="" type="checkbox"/> Ephemeral	<input checked="" type="checkbox"/> Dry at time of the survey
<u>MANAGED HYDROLOGY - PUMPING INTO SILVERNAKE POND</u>	

Indicators

<input type="checkbox"/> Standing or flowing water with no indication of recent precipitation	<input type="checkbox"/> Channel adjacent to shelf with steep side	<input type="checkbox"/> Natural / irrigation / manmade / ditch flowing into feature
<input type="checkbox"/> presence of hydrophytic vegetation	<input type="checkbox"/> Natural line, stain or mineral (salt) deposit	<input type="checkbox"/> Dated picture / account showing / referring to identifiable features
<input type="checkbox"/> Presence of hydric soil with or without hydrophytic vegetation	<input type="checkbox"/> Litter, debris and or clay deposits	<input checked="" type="checkbox"/> Wetland symbol on map (presence of solid or dotted blue line, solid, shaded or stippled blue area on map)
<input type="checkbox"/> Absence of vegetation or interruption of upland vegetation	<input type="checkbox"/> Algae or alga mat	<input type="checkbox"/> Other (Specify)

Notes: BLUE LINE ON USGS TOPO MAP FOR CALABASAS QUAD; NWI (PFCA) FORESTED/SHRUB WETLAND AND MTD STREAM

- NO EVIDENCE OF RECENT FLOW IN THIS AREA

Channel Characteristics

Channel Width	13.7 FT	
Channel Depth	8 INCHES	
High Water Line Width	N/A	
High Water Line Depth	N/A	
Channel Substrate (check all that apply)		
<input type="checkbox"/> Sand	<input checked="" type="checkbox"/> Cobble	<input type="checkbox"/> Silt / Clay
<input checked="" type="checkbox"/> Gravel	<input type="checkbox"/> Rock	<input type="checkbox"/> Other _____

Vegetation Characteristics of Channel or Basin

Vegetated Channel or Basin?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Dominant / Characteristic Species		
PIPTATHERUM MILACEUM ~ 75% COVER		
WITHIN THE CHANNEL		
CARDUS PYCNOCEPHALUS ~ 5% COVER		

Vegetation Adjacent to Channel

Dominant / Characteristic Species
QUERCUS AGRIFOLIA
TOXICODENDRON DIVERSILOBUM
Yucca

Notes: _____

ARID REGIONS - WETLAND DELINEATION DATA SHEET

Project: NASA - Santa Susana Field Lab Date: 11/5/2012Observers: Russell Huddleston and Steve LongFeature Name BELL CREEK SW Sample Point SP-5 BC-13GPS Location: 34° 13' 26.801" 118° 42' 26.356"

Geomorphic Feature

<input type="checkbox"/> River	<input type="checkbox"/> Lake	<input type="checkbox"/> Swale
<input checked="" type="checkbox"/> Stream	<input type="checkbox"/> Pond	<input type="checkbox"/> Erosional Channel
<input type="checkbox"/> Canal	<input type="checkbox"/> Impoundment	<input type="checkbox"/> Gully
<input type="checkbox"/> Irrigation Channel	<input type="checkbox"/> Playa	<input type="checkbox"/> Depressional Basin
<input type="checkbox"/> Drainage Channel	<input type="checkbox"/> Constructed Basin	<input type="checkbox"/> Rock Basin
<input type="checkbox"/> Excavated Ditch	<input type="checkbox"/> Unvegetated Depression	<input type="checkbox"/> Other: _____

Apparent Hydrologic Regime

<input type="checkbox"/> Perennial	<input type="checkbox"/> Standing Water (Depth: _____)
<input type="checkbox"/> Intermittent	<input type="checkbox"/> Flowing Water (Depth: _____)
<input checked="" type="checkbox"/> Ephemeral	<input checked="" type="checkbox"/> Dry at time of the survey
<u>HIGHLY MANAGED - PUMPING INTO SILVERNALE POND</u>	

Indicators

<input type="checkbox"/> Standing or flowing water with no indication of recent precipitation	<input type="checkbox"/> Channel adjacent to shelf with steep side	<input type="checkbox"/> Natural / irrigation / manmade / ditch flowing into feature
<input type="checkbox"/> presence of hydrophytic vegetation	<input type="checkbox"/> Natural line, stain or mineral (salt) deposit	<input type="checkbox"/> Dated picture / account showing / referring to identifiable features
<input type="checkbox"/> Presence of hydric soil with or without hydrophytic vegetation	<input type="checkbox"/> Litter, debris and or clay deposits	<input checked="" type="checkbox"/> Wetland symbol on map (presence of solid or dotted blue line, solid, shaded or stippled blue area on map)
<input type="checkbox"/> Absence of vegetation or interruption of upland vegetation	<input type="checkbox"/> Algae or alga mat	<input type="checkbox"/> Other (Specify)

Notes: SHOWN AS A BLUE LINE ON USGS TOPO MAP FOR THE CALABASAS QUAD; NWI (PFOA) FORESTED/SCRUB WETLAND; MHD STREAM

NO EVIDENCE OF RECENT FLOW IN THIS AREA

Channel Characteristics

Channel Width	9.4 FT	
Channel Depth	10 INCHES	
High Water Line Width <i>Low Flow</i>	5.8 FT	
High Water Line Depth <i>Low Flow</i>	2 INCHES	
Channel Substrate (check all that apply)		
<input checked="" type="checkbox"/> Sand	<input checked="" type="checkbox"/> Cobble	<input type="checkbox"/> Silt / Clay
<input checked="" type="checkbox"/> Gravel	<input type="checkbox"/> Rock	<input type="checkbox"/> Other _____

Vegetation Characteristics of Channel or Basin

Vegetated Channel or Basin?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Dominant / Characteristic Species		
PIPTATHERUM MILACEUM		} LESS THAN 10% TOTAL COVER
BRASSICA NIGRA		
CARDUS PYNOCEPHALUS		
RUBUS URSINUS		

Vegetation Adjacent to Channel

Dominant / Characteristic Species
TOXICODENDRON DIVERSILOBUM, PLATANUS RACEMOSA
SYMPHORICARPOS MOLLIS, RUBUS URSINUS, GALLUM SP.
RIBES MALVACEUM, KECKIELLA CORDIFOLIA,
PHACELIA RAMOSISSIMA, PIPTATHERUM MILACEUM
WATER

Notes:

ARID REGIONS - WETLAND DELINEATION DATA SHEET

Project: NASA - Santa Susana Field Lab Date: 1/6/2012Observers: Russell Huddleston and Steve LongFeature Name BELL CREEK CDFP-TRIBUTARY Sample Point ~~ST~~ BCT-1GPS Location: 34° 13' 39.190" 118° 42' 26.552

Geomorphic Feature

<input type="checkbox"/> River	<input type="checkbox"/> Lake	<input type="checkbox"/> Swale
<input checked="" type="checkbox"/> Stream	<input type="checkbox"/> Pond	<input type="checkbox"/> Erosional Channel
<input type="checkbox"/> Canal	<input type="checkbox"/> Impoundment	<input type="checkbox"/> Gully
<input type="checkbox"/> Irrigation Channel	<input type="checkbox"/> Playa	<input type="checkbox"/> Depressional Basin
<input type="checkbox"/> Drainage Channel	<input type="checkbox"/> Constructed Basin	<input type="checkbox"/> Rock Basin
<input type="checkbox"/> Excavated Ditch	<input type="checkbox"/> Unvegetated Depression	<input type="checkbox"/> Other: _____

Apparent Hydrologic Regime

<input type="checkbox"/> Perennial	<input type="checkbox"/> Standing Water (Depth: _____)
<input type="checkbox"/> Intermittent	<input type="checkbox"/> Flowing Water (Depth: _____)
<input checked="" type="checkbox"/> Ephemeral	<input checked="" type="checkbox"/> Dry at time of the survey

Indicators

<input type="checkbox"/> Standing or flowing water with no indication of recent precipitation	<input checked="" type="checkbox"/> Channel adjacent to shelf with steep side	<input type="checkbox"/> Natural / irrigation / manmade / ditch flowing into feature
<input type="checkbox"/> presence of hydrophytic vegetation	<input type="checkbox"/> Natural line, stain or mineral (salt) deposit	<input type="checkbox"/> Dated picture / account showing / referring to identifiable features
<input type="checkbox"/> Presence of hydric soil with or without hydrophytic vegetation	<input checked="" type="checkbox"/> Litter, debris and or clay deposits	<input type="checkbox"/> Wetland symbol on map (presence of solid or dotted blue line, solid, shaded or stippled blue area on map)
<input checked="" type="checkbox"/> Absence of vegetation or interruption of upland vegetation	<input type="checkbox"/> Algae or alga mat	<input type="checkbox"/> Other (Specify)

Notes: TRIBUTARY CHANNEL TO BELL CREEK - NOT SHOWN AS A BLUE LINE, NHD OR NWI WETLAND - WELL DEFINED CHANNEL WITH DEBRIS LINES AND WRACKING IN THE CHANNEL

Channel Characteristics

Channel Width	4 FT	
Channel Depth	12 - 24 INCHES	
High Water Line Width	2.3 FT	
High Water Line Depth	12 INCHES	
Channel Substrate (check all that apply)		
<input checked="" type="checkbox"/> Sand	<input type="checkbox"/> Cobble	<input type="checkbox"/> Silt / Clay
<input type="checkbox"/> Gravel	<input type="checkbox"/> Rock	<input type="checkbox"/> Other _____

Vegetation Characteristics of Channel or Basin

Vegetated Channel or Basin?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Dominant / Characteristic Species		

Vegetation Adjacent to Channel

Dominant / Characteristic Species
BACCHARIS PILULARIS, CENANTHUS SP.
RIBES MALVACEUM, ADENOSTOMA FASCICULATUM
QUERCUS AGRIFOLIA, CARDUUS PYNOCEPHALUS
BRASSICA NIGRA

Notes: _____

ARID REGIONS - WETLAND DELINEATION DATA SHEET

Project: NASA - Santa Susana Field Lab Date: 1/6/2012Observers: Russell Huddleston and Steve LongFeature Name ~~FE~~ PLF DRAINAGE Sample Point —GPS Location: AUE: 34° 13' 35.238" 118° 42' 14.049"

Geomorphic Feature

<input type="checkbox"/> River	<input type="checkbox"/> Lake	<input type="checkbox"/> Swale
<input type="checkbox"/> Stream	<input type="checkbox"/> Pond	<input checked="" type="checkbox"/> Erosional Channel
<input type="checkbox"/> Canal	<input type="checkbox"/> Impoundment	<input type="checkbox"/> Gully
<input type="checkbox"/> Irrigation Channel	<input type="checkbox"/> Playa	<input type="checkbox"/> Depressional Basin
<input type="checkbox"/> Drainage Channel	<input type="checkbox"/> Constructed Basin	<input type="checkbox"/> Rock Basin
<input type="checkbox"/> Excavated Ditch	<input type="checkbox"/> Unvegetated Depression	<input type="checkbox"/> Other: _____

Apparent Hydrologic Regime

<input type="checkbox"/> Perennial	<input type="checkbox"/> Standing Water (Depth: _____)
<input type="checkbox"/> Intermittent	<input type="checkbox"/> Flowing Water (Depth: _____)
<input checked="" type="checkbox"/> Ephemeral	<input checked="" type="checkbox"/> Dry at time of the survey

Indicators

<input type="checkbox"/> Standing or flowing water with no indication of recent precipitation	<input type="checkbox"/> Channel adjacent to shelf with steep side	<input type="checkbox"/> Natural / irrigation / manmade / ditch flowing into feature
<input type="checkbox"/> presence of hydrophytic vegetation	<input type="checkbox"/> Natural line, stain or mineral (salt) deposit	<input type="checkbox"/> Dated picture / account showing / referring to identifiable features
<input type="checkbox"/> Presence of hydric soil with or without hydrophytic vegetation	<input type="checkbox"/> Litter, debris and or clay deposits	<input type="checkbox"/> Wetland symbol on map (presence of solid or dotted blue line, solid, shaded or stippled blue area on map)
<input checked="" type="checkbox"/> Absence of vegetation or interruption of upland vegetation	<input type="checkbox"/> Algae or alga mat	<input type="checkbox"/> Other (Specify)

Notes: NOT SHOWN AS A BLUE LINE ON USGS TOPO,
NOT IN NHD, NO NWI MAPPED WETLANDS
IN THIS AREA

- EROSIONAL CHANNEL - GENERALLY LACKING
VEGETATION - BUT NO SIGNIFICANT EVIDENCE
OF RECENT FLOW IN THIS AREA

Channel Characteristics

Channel Width	(1) 2-3 FT
Channel Depth	12-14 INCHES
High Water Line Width	-
High Water Line Depth	-
Channel Substrate (check all that apply)	
<input checked="" type="checkbox"/> Sand	<input checked="" type="checkbox"/> Cobble
<input type="checkbox"/> Gravel	<input type="checkbox"/> Rock
<input type="checkbox"/> Silt / Clay	<input type="checkbox"/> Other _____
SANDY CHANNEL W/ SOME (SPARSE) COBBLE	

Vegetation Characteristics of Channel or Basin

Vegetated Channel or Basin?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Dominant / Characteristic Species		

Vegetation Adjacent to Channel

Dominant / Characteristic Species
QUERCUS AGRIFOLIA, TOXICODENDRON DIVERSILOBUM
RIBES MALVACEUM, VENEGASIA CARPESIOIDES,
ARTEMESIA CALIFORNICA, PITACELIA RAMOSISSIMA,
BRAMUS DIANDRUS, PIPITATHERUM MILACEUM,
CARDUS PTYNOCEPHALUS

Notes: UPSTREAM PART OF DRAINAGE AT LARGE SANDSTONE ROCKS - 1-2 FOOT WIDE 6-12 INCH DEEP EROSIONAL CHANNEL (SANDY) - SOME GRAY COBBLES - BECOMES SLIGHTLY WIDER - 2-3 FT DOWN STREAM

AT END OF EROSIONAL FEATURE - WEAKLY EXPRESSED FLOW CHANNEL INTO CONCRETE APRON AND 24" CULVERT- DRAINS INTO R2A POND OVERFLOW AREA

ARID REGIONS - WETLAND DELINEATION DATA SHEET

Project: NASA - Santa Susana Field Lab Date: 1/3/2012Observers: Russell Huddleston and Steve LongFeature Name COCA DRAINAGE Sample Point ~~SP-1~~ CD-1GPS Location: 34° 13' 34.972" 118° 41' 51.677"

Geomorphic Feature

<input type="checkbox"/> River	<input type="checkbox"/> Lake	<input type="checkbox"/> Swale
<input checked="" type="checkbox"/> Stream	<input type="checkbox"/> Pond	<input type="checkbox"/> Erosional Channel
<input type="checkbox"/> Canal	<input type="checkbox"/> Impoundment	<input type="checkbox"/> Gully
<input type="checkbox"/> Irrigation Channel	<input type="checkbox"/> Playa	<input type="checkbox"/> Depressional Basin
<input type="checkbox"/> Drainage Channel	<input type="checkbox"/> Constructed Basin	<input type="checkbox"/> Rock Basin
<input type="checkbox"/> Excavated Ditch	<input type="checkbox"/> Unvegetated Depression	<input type="checkbox"/> Other: _____

Apparent Hydrologic Regime

<input type="checkbox"/> Perennial	<input type="checkbox"/> Standing Water (Depth: _____)
<input type="checkbox"/> Intermittent	<input type="checkbox"/> Flowing Water (Depth: _____)
<input checked="" type="checkbox"/> Ephemeral	<input checked="" type="checkbox"/> Dry at time of the survey

Indicators

<input type="checkbox"/> Standing or flowing water with no indication of recent precipitation	<input type="checkbox"/> Channel adjacent to shelf with steep side	<input type="checkbox"/> Natural / irrigation / manmade / ditch flowing into feature
<input type="checkbox"/> presence of hydrophytic vegetation	<input type="checkbox"/> Natural line, stain or mineral (salt) deposit	<input type="checkbox"/> Dated picture / account showing / referring to identifiable features
<input type="checkbox"/> Presence of hydric soil with or without hydrophytic vegetation	<input type="checkbox"/> Litter, debris and or clay deposits	<input checked="" type="checkbox"/> Wetland symbol on map (presence of solid or dotted blue line, solid, shaded or stippled blue area on map)
<input type="checkbox"/> Absence of vegetation or interruption of upland vegetation	<input type="checkbox"/> Algae or alga mat	<input checked="" type="checkbox"/> Other (Specify)

Notes: SHOWN AS A BLUE LINE ON USGS 7.5 MIN TOPO MAP FOR THE CALABASAS QUAD. - NOT SHOWN IN THE NHD

- SOME STAINING AND CORROSION ON GUNITE INDICATING WATER FLOW

Channel Characteristics

Channel Width	26 ft
Channel Depth	2 ft
High Water Line Width ^{Low Flow}	4 ft
High Water Line Depth ^{Low Flow}	1-2 "
Channel Substrate (check all that apply)	
<input type="checkbox"/> Sand	<input type="checkbox"/> Cobble
<input type="checkbox"/> Gravel	<input type="checkbox"/> Rock
<input type="checkbox"/> Silt / Clay	
<input checked="" type="checkbox"/> Other <u>GUNITE</u>	

Vegetation Characteristics of Channel or Basin

Vegetated Channel or Basin?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Dominant / Characteristic Species		
<u>BACCHARIS SALICIFOLIA - SPARSELY SCATTERED IN CRACKS</u>		
<u>PIPTATHERUM MILACEUM - SPARSE IN CRACKS</u>		
<u>- GENERALLY < 5% VEGETATION PRESENT - GUNITE</u>		
<u>LINED CHANNEL</u>		

Vegetation Adjacent to Channel

Dominant / Characteristic Species
<u>MALOSOMA LAURINA</u>
<u>BACCHARIS SALICIFOLIA, B. PILULARIS</u>
<u>SALIX LASIOLEPIS - FEW SAPLINGS SOUTH SIDE < 3" DBH</u>
<u>TOXICODENDRON DIVERSILOBUM</u>
<u>ERIODICTYON CRASSIFOLIUM</u>
<u>ERIODICTYON CALIFORNICUM</u>
<u>Avena BARBATA, PIPTATHERUM MILACEUM</u>

Notes:

AREA HIGHLY ALTERED BY CONSTRUCTION OF TEST
STANDS - GUNITE SLOPES AND DRAINAGE CHANNEL

ARID REGIONS - WETLAND DELINEATION DATA SHEET

Project: NASA - Santa Susana Field Lab Date: 1/31/2012Observers: Russell Huddleston and Steve LongFeature Name COCA DRAINAGE Sample Point SP-2 CD-2GPS Location: 34° 13' 35.934" 118° 41' 58.161"

Geomorphic Feature

<input type="checkbox"/> River	<input type="checkbox"/> Lake	<input type="checkbox"/> Swale
<input checked="" type="checkbox"/> Stream	<input type="checkbox"/> Pond	<input type="checkbox"/> Erosional Channel
<input type="checkbox"/> Canal	<input type="checkbox"/> Impoundment	<input type="checkbox"/> Gully
<input type="checkbox"/> Irrigation Channel	<input type="checkbox"/> Playa	<input type="checkbox"/> Depressional Basin
<input type="checkbox"/> Drainage Channel	<input type="checkbox"/> Constructed Basin	<input type="checkbox"/> Rock Basin
<input type="checkbox"/> Excavated Ditch	<input type="checkbox"/> Unvegetated Depression	<input type="checkbox"/> Other: _____

Apparent Hydrologic Regime

<input type="checkbox"/> Perennial	<input type="checkbox"/> Standing Water (Depth: _____)
<input type="checkbox"/> Intermittent	<input type="checkbox"/> Flowing Water (Depth: _____)
<input checked="" type="checkbox"/> Ephemeral	<input checked="" type="checkbox"/> Dry at time of the survey

Indicators

<input type="checkbox"/> Standing or flowing water with no indication of recent precipitation	<input type="checkbox"/> Channel adjacent to shelf with steep side	<input type="checkbox"/> Natural / irrigation / manmade / ditch flowing into feature
<input type="checkbox"/> presence of hydrophytic vegetation	<input type="checkbox"/> Natural line, stain or mineral (salt) deposit	<input type="checkbox"/> Dated picture / account showing / referring to identifiable features
<input type="checkbox"/> Presence of hydric soil with or without hydrophytic vegetation	<input type="checkbox"/> Litter, debris and or clay deposits	<input checked="" type="checkbox"/> Wetland symbol on map (presence of solid or dotted blue line, solid, shaded or stippled blue area on map)
<input type="checkbox"/> Absence of vegetation or interruption of upland vegetation	<input type="checkbox"/> Algae or alga mat	<input type="checkbox"/> Other (Specify)

Notes: SHOWN AS BLUE LINE ON USGS 7.5 MIN TOPO
QUAD: CALABASAS - NOT INCLUDED IN NHD
- WATER STAINING AND CORROSION EVIDENT
IN GUNITE CHANNEL

Channel Characteristics

Channel Width	30 ft
Channel Depth	2 ft
High Water Line Width <i>Low Flow</i>	4.5 ft
High Water Line Depth <i>Low Flow</i>	1-2 in
Channel Substrate (check all that apply)	
<input type="checkbox"/> Sand	<input type="checkbox"/> Cobble
<input type="checkbox"/> Gravel	<input type="checkbox"/> Rock
<input type="checkbox"/> Silt / Clay	<input checked="" type="checkbox"/> Other <u>GUNITE</u>

Vegetation Characteristics of Channel or Basin

Vegetated Channel or Basin?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Dominant / Characteristic Species		
<i>BACCHARIS SALICIFOLIA</i> - GENERALLY SPARSE AND		
SCATTERED IN CRACKS BUT		
LOCALLY DENSE IN A FEW		
AREAS OF THE CHANNEL		

Vegetation Adjacent to Channel

Dominant / Characteristic Species
<i>ERIODICTYON</i> ^{<i>CRASSIFOLIUM</i>} <i>CACTIFORME</i>
<i>MAIOSOMA LAURINA</i>
<i>TOXICODENDRON DIVERSILOBUM</i>
<i>BACCHARIS PILULARIS</i>
<i>CENTAUREA MELITENSIS</i> , <i>HETEROTHECA GRANDIFLORA</i> ,
<i>PENNISETUM SETACEUM</i> , <i>PSEUDOGNAPHALUM BIOLETTII</i>

Notes:

GUNITE CHANNEL THAT FLOWS WEST INTO COCA POND. THE UPSTREAM PORTION OF THE CHANNEL NEAR THIS POINT BLOCKED WITH SINGLE ROW OF SAND BAGS THE DOWNSTREAM PORTION OF THE GUNITE CHANNEL TERMINATES AT 3 CULVERTS - ONE CULVERT WITH A CLOSED VALVE AND TWO CULVERTS HAVE BEEN SEALED WITH HEAVY RUBBER COVERS NO INDICATION OF WATER PONDING BEHIND THESE CULVERTS

ARID REGIONS - WETLAND DELINEATION DATA SHEET

Project: NASA - Santa Susana Field Lab Date: 1/31/2012Observers: Russell Huddleston and Steve LongFeature Name COCA DRAINAGE Sample Point ~~SP-3~~ CD-3GPS Location: 34° 13' 37.907" 118° 42' 02.894"

Geomorphic Feature

<input type="checkbox"/> River	<input type="checkbox"/> Lake	<input type="checkbox"/> Swale
<input checked="" type="checkbox"/> Stream	<input type="checkbox"/> Pond	<input type="checkbox"/> Erosional Channel
<input type="checkbox"/> Canal	<input type="checkbox"/> Impoundment	<input type="checkbox"/> Gully
<input type="checkbox"/> Irrigation Channel	<input type="checkbox"/> Playa	<input type="checkbox"/> Depressional Basin
<input type="checkbox"/> Drainage Channel	<input type="checkbox"/> Constructed Basin	<input type="checkbox"/> Rock Basin
<input type="checkbox"/> Excavated Ditch	<input type="checkbox"/> Unvegetated Depression	<input type="checkbox"/> Other: _____

Apparent Hydrologic Regime

<input type="checkbox"/> Perennial	<input type="checkbox"/> Standing Water (Depth: _____)
<input type="checkbox"/> Intermittent	<input type="checkbox"/> Flowing Water (Depth: _____)
<input checked="" type="checkbox"/> Ephemeral	<input checked="" type="checkbox"/> Dry at time of the survey

Indicators

<input type="checkbox"/> Standing or flowing water with no indication of recent precipitation	<input type="checkbox"/> Channel adjacent to shelf with steep side	<input type="checkbox"/> Natural / irrigation / manmade / ditch flowing into feature
<input type="checkbox"/> presence of hydrophytic vegetation	<input type="checkbox"/> Natural line, stain or mineral (salt) deposit	<input type="checkbox"/> Dated picture / account showing / referring to identifiable features
<input type="checkbox"/> Presence of hydric soil with or without hydrophytic vegetation	<input type="checkbox"/> Litter, debris and or clay deposits	<input checked="" type="checkbox"/> Wetland symbol on map (presence of solid or dotted blue line, solid, shaded or stippled blue area on map)
<input type="checkbox"/> Absence of vegetation or interruption of upland vegetation	<input type="checkbox"/> Algae or alga mat	<input checked="" type="checkbox"/> Other (Specify)

Notes: SHOWN AS BLUE LINE ON USGS 7.5 MIN. TOPO MAP
CAJABAS QUAD - NOT INCLUDED IN THE NHD

- CONSTRUCTED CONCRETE DITCH FOR COCA
POND OVERFLOW AND SITE DRAINAGE -
HIGHLY ALTERED NATURAL DRAINAGE CHANNEL

Channel Characteristics

Channel Width	12 ft - TOP OF BANK - BANK	
Channel Depth	4 - 4.5 ft	
High Water Line Width <small>LOW FLOW</small>	5 ft	
High Water Line Depth <small>LOW FLOW</small>	~ 12 INCHES OR LESS	
Channel Substrate (check all that apply)		
<input type="checkbox"/> Sand	<input type="checkbox"/> Cobble	<input type="checkbox"/> Silt / Clay
<input type="checkbox"/> Gravel	<input type="checkbox"/> Rock	<input checked="" type="checkbox"/> Other <u>CONCRETE</u>

Vegetation Characteristics of Channel or Basin

Vegetated Channel or Basin?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Dominant / Characteristic Species		

Vegetation Adjacent to Channel

Dominant / Characteristic Species
ACMISPON GLABER (= LOTUS SCOPARIUS)
ERIOGONUM FASCICULATUM
BRASSICA NIGRA
BACCHARIS PILULARIS
ERIODICTION ^{CRASSIFOLIUM} CALIFORNICUM

Notes: - SOUTH END OF DITCH FILLED WITH SOIL -
 NO CULVERT EVIDENT AT START OF THE
 CONCRETE CHANNEL

APPROX 2" OF SAND IN THE BOTTOM OF THE
 CHANNEL - NO VEGETATION PRESENT AND
 NO EVIDENCE OF FLOWING WATER IN
 THIS LOCATION

ARID REGIONS - WETLAND DELINEATION DATA SHEET

Project: NASA - Santa Susana Field Lab Date: 1/3/2012Observers: Russell Huddleston and Steve LongFeature Name COCA DRAINAGE Sample Point SP-4 CD-4GPS Location: 34° 13' 37.543" 118° 42' 05.274"

Geomorphic Feature

<input type="checkbox"/> River	<input type="checkbox"/> Lake	<input type="checkbox"/> Swale
<input checked="" type="checkbox"/> Stream	<input type="checkbox"/> Pond	<input type="checkbox"/> Erosional Channel
<input type="checkbox"/> Canal	<input type="checkbox"/> Impoundment	<input type="checkbox"/> Gully
<input type="checkbox"/> Irrigation Channel	<input type="checkbox"/> Playa	<input type="checkbox"/> Depressional Basin
<input type="checkbox"/> Drainage Channel	<input type="checkbox"/> Constructed Basin	<input type="checkbox"/> Rock Basin
<input type="checkbox"/> Excavated Ditch	<input type="checkbox"/> Unvegetated Depression	<input type="checkbox"/> Other: _____

Apparent Hydrologic Regime

<input type="checkbox"/> Perennial	<input type="checkbox"/> Standing Water (Depth: _____)
<input type="checkbox"/> Intermittent	<input type="checkbox"/> Flowing Water (Depth: _____)
<input checked="" type="checkbox"/> Ephemeral	<input checked="" type="checkbox"/> Dry at time of the survey

Indicators

<input type="checkbox"/> Standing or flowing water with no indication of recent precipitation	<input type="checkbox"/> Channel adjacent to shelf with steep side	<input type="checkbox"/> Natural / irrigation / manmade / ditch flowing into feature
<input type="checkbox"/> presence of hydrophytic vegetation	<input type="checkbox"/> Natural line, stain or mineral (salt) deposit	<input type="checkbox"/> Dated picture / account showing / referring to identifiable features
<input type="checkbox"/> Presence of hydric soil with or without hydrophytic vegetation	<input type="checkbox"/> Litter, debris and or clay deposits	<input checked="" type="checkbox"/> Wetland symbol on map (presence of solid or dotted blue line, solid, shaded or stippled blue area on map)
<input type="checkbox"/> Absence of vegetation or interruption of upland vegetation	<input type="checkbox"/> Algae or alga mat	<input checked="" type="checkbox"/> Other (Specify)

Notes: SHOWN AS BLUE LINE ON USGS 7.5 MIN TOPO FOR THE CALABASAS QUAD. NOT INCLUDED IN THE NHD

- HIGHLY ALTERED NATURAL DRAINAGE FOR COCA POND OVERFLOW AND SITE DRAINAGE

Channel Characteristics

Channel Width	10.8 ft	
Channel Depth	2 ft	
High Water Line Width <small>LOW FLOW</small>	~3 ft	
High Water Line Depth <small>LOW FLOW</small>	1-2 INCHES	
Channel Substrate (check all that apply)		
<input type="checkbox"/> Sand	<input type="checkbox"/> Cobble	<input type="checkbox"/> Silt / Clay
<input type="checkbox"/> Gravel	<input type="checkbox"/> Rock	<input checked="" type="checkbox"/> Other <u>CONCRETE</u>

Vegetation Characteristics of Channel or Basin

Vegetated Channel or Basin?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Dominant / Characteristic Species		

Vegetation Adjacent to Channel

Dominant / Characteristic Species
TOXICODENDRON DIVERSILOBUM
MALACOTHAMNUS FASCICULARIS
BACCHARIS SALICIFOLIA
MALOSOMA LAURINA
BACCHARIS PILULARIS
ERIODICTYON ^{CRASSIFOLIUM} CASTROVIEJOA

Notes: SAMPLE POINT DOWNSTREAM OF SMALL DRAINAGE INLET - NO SEDIMENT THIS LOCATION, BUT LOTS OF LEAF LITTER - NO EVIDENCE OF RECENT FLOW

ARID REGIONS - WETLAND DELINEATION DATA SHEET

Project: NASA - Santa Susana Field Lab Date: 11/3/2012Observers: Russell Huddleston and Steve LongFeature Name COCA DRAINAGE Sample Point SP-5 CD-5GPS Location: 34° 13' 38.609" 118° 42' 13.874"

Geomorphic Feature

<input type="checkbox"/> River	<input type="checkbox"/> Lake	<input type="checkbox"/> Swale
<input checked="" type="checkbox"/> Stream	<input type="checkbox"/> Pond	<input type="checkbox"/> Erosional Channel
<input type="checkbox"/> Canal	<input type="checkbox"/> Impoundment	<input type="checkbox"/> Gully
<input type="checkbox"/> Irrigation Channel	<input type="checkbox"/> Playa	<input type="checkbox"/> Depressional Basin
<input type="checkbox"/> Drainage Channel	<input type="checkbox"/> Constructed Basin	<input type="checkbox"/> Rock Basin
<input type="checkbox"/> Excavated Ditch	<input type="checkbox"/> Unvegetated Depression	<input type="checkbox"/> Other: _____

Apparent Hydrologic Regime

<input type="checkbox"/> Perennial	<input type="checkbox"/> Standing Water (Depth: _____)
<input type="checkbox"/> Intermittent	<input type="checkbox"/> Flowing Water (Depth: _____)
<input checked="" type="checkbox"/> Ephemeral	<input checked="" type="checkbox"/> Dry at time of the survey

Indicators

<input type="checkbox"/> Standing or flowing water with no indication of recent precipitation	<input type="checkbox"/> Channel adjacent to shelf with steep side	<input type="checkbox"/> Natural / irrigation / manmade / ditch flowing into feature
<input type="checkbox"/> presence of hydrophytic vegetation	<input type="checkbox"/> Natural line, stain or mineral (salt) deposit	<input type="checkbox"/> Dated picture / account showing / referring to identifiable features
<input type="checkbox"/> Presence of hydric soil with or without hydrophytic vegetation	<input checked="" type="checkbox"/> Litter, debris and or clay deposits	<input checked="" type="checkbox"/> Wetland symbol on map (presence of solid or dotted blue line, solid, shaded or stippled blue area on map)
<input type="checkbox"/> Absence of vegetation or interruption of upland vegetation	<input type="checkbox"/> Algae or alga mat	<input checked="" type="checkbox"/> Other (Specify)

Notes: SHOWN AS BLUE LINE ON USGS 7.5 MIN TOPO FOR THE CALABASAS QUAD - NOT INCLUDED IN THE NHD

- SOME WATER STAINING - CORROSION OBSERVED IN TWO UPSTREAM CULVERTS, - SOME LITTER / DEBRIS WASHING IN THE CHANNEL, ABSENCE OF LEAF LITTER

Channel Characteristics

Channel Width	10 ft	
Channel Depth	10 INCHES	
High Water Line Width	LOW FLOW	2 ft
High Water Line Depth	LOW FLOW	4 INCHES
Channel Substrate (check all that apply)		
<input checked="" type="checkbox"/> Sand	<input type="checkbox"/> Cobble	<input type="checkbox"/> Silt / Clay
<input checked="" type="checkbox"/> Gravel	<input checked="" type="checkbox"/> Rock	<input type="checkbox"/> Other _____
SANDSTONE BEDROCK W/ SAND AND SOME GRAVEL		

Vegetation Characteristics of Channel or Basin

Vegetated Channel or Basin?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Dominant / Characteristic Species		
BRASSICA NIGRA - 10-15%		
BACCHARIS SALICIFOLIA - SPARSE < 5%		
CARDUUS PYCNOCEPHALUS - SPARSE		

Vegetation Adjacent to Channel

Dominant / Characteristic Species
ERIODICTON CRASSIFOLIUM, MALVOSA LAURINA,
RIBES MALVACEUM, MIMULUS AURANTIACUS
BACCHARIS PILULARIS, PHACELIA RAMOSISSIMA,
PSEUDOGNAPHALUM BIOLETTII

Notes: SAMPLE POINT TAKEN DOWN STREAM OF DOUBLE CULVERT 42" AND 24" DIAM. - AT THE END OF CONCRETE DRAINAGE CHANNEL, THIS SECTION OF THE CHANNEL APPEARS MORE NATURAL

- FLOWS WEST INTO RZA POND

ARID REGIONS - WETLAND DELINEATION DATA SHEET

Project: NASA - Santa Susana Field Lab Date: 11/3/2012Observers: Russell Huddleston and Steve LongFeature Name COCA DRAINAGE Sample Point SP-6 CD-6GPS Location: 34° 13' 38.504" 118° 42' 15.023"

Geomorphic Feature

<input type="checkbox"/> River	<input type="checkbox"/> Lake	<input type="checkbox"/> Swale
<input checked="" type="checkbox"/> Stream	<input type="checkbox"/> Pond	<input type="checkbox"/> Erosional Channel
<input type="checkbox"/> Canal	<input type="checkbox"/> Impoundment	<input type="checkbox"/> Gully
<input type="checkbox"/> Irrigation Channel	<input type="checkbox"/> Playa	<input type="checkbox"/> Depressional Basin
<input type="checkbox"/> Drainage Channel	<input type="checkbox"/> Constructed Basin	<input type="checkbox"/> Rock Basin
<input type="checkbox"/> Excavated Ditch	<input type="checkbox"/> Unvegetated Depression	<input type="checkbox"/> Other: _____

Apparent Hydrologic Regime

<input type="checkbox"/> Perennial	<input type="checkbox"/> Standing Water (Depth: _____)
<input type="checkbox"/> Intermittent	<input type="checkbox"/> Flowing Water (Depth: _____)
<input checked="" type="checkbox"/> Ephemeral	<input checked="" type="checkbox"/> Dry at time of the survey

Indicators

<input type="checkbox"/> Standing or flowing water with no indication of recent precipitation	<input type="checkbox"/> Channel adjacent to shelf with steep side	<input type="checkbox"/> Natural / irrigation / manmade / ditch flowing into feature
<input type="checkbox"/> presence of hydrophytic vegetation	<input type="checkbox"/> Natural line, stain or mineral (salt) deposit	<input type="checkbox"/> Dated picture / account showing / referring to identifiable features
<input type="checkbox"/> Presence of hydric soil with or without hydrophytic vegetation	<input checked="" type="checkbox"/> Litter, debris and or clay deposits	<input checked="" type="checkbox"/> Wetland symbol on map (presence of solid or dotted blue line, solid, shaded or stippled blue area on map)
<input checked="" type="checkbox"/> Absence of vegetation or interruption of upland vegetation	<input type="checkbox"/> Algae or alga mat	<input type="checkbox"/> Other (Specify)

Notes: SHOWN AS A BLUE LINE ON USGS TOPO 7.5 MIN
QUAD: CALABASAS - NOT INCLUDED IN NAD
- SMALL AMOUNT OF LITTER / DEBRIS W/PAVING IN
CHANNEL

Channel Characteristics

Channel Width	12 ft
Channel Depth	3 ft
High Water Line Width <small>Low Flow</small>	2 ft
High Water Line Depth <small>Low Flow</small>	1 ft
Channel Substrate (check all that apply)	
<input checked="" type="checkbox"/> Sand	<input type="checkbox"/> Cobble
<input checked="" type="checkbox"/> Gravel	<input checked="" type="checkbox"/> Rock
<input type="checkbox"/> Silt / Clay	<input type="checkbox"/> Other _____
- SANDSTONE BOULDERS IN CHANNEL - SAND W/ SOME GRAVEL	

Vegetation Characteristics of Channel or Basin

Vegetated Channel or Basin?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Dominant / Characteristic Species		

Vegetation Adjacent to Channel

Dominant / Characteristic Species
ERIODICTYON CRASSIFOLIUM
QUERCUS AGRIFOLIA
BRASSICA NIGRA, PHACELIA RAMOSISSIMA,
CARDUS PYCNOCEPHALUS, MIMULUS AURANTIACUS

Notes: NATURAL DRAINAGE CHANNEL - SEVERAL
LARGE SANDSTONE BOULDERS PRESENT WITHIN CHANNEL
FLOWS WEST INTO RZA POND

ARID REGIONS - WETLAND DELINEATION DATA SHEET

Project: NASA - Santa Susana Field Lab Date: 1/3/2012Observers: Russell Huddleston and Steve LongFeature Name COCA DRAINAGE Sample Point SP-7 CD-7

GPS Location: _____

Geomorphic Feature

<input type="checkbox"/> River	<input type="checkbox"/> Lake	<input type="checkbox"/> Swale
<input checked="" type="checkbox"/> Stream	<input type="checkbox"/> Pond	<input type="checkbox"/> Erosional Channel
<input type="checkbox"/> Canal	<input type="checkbox"/> Impoundment	<input type="checkbox"/> Gully
<input type="checkbox"/> Irrigation Channel	<input type="checkbox"/> Playa	<input type="checkbox"/> Depressional Basin
<input type="checkbox"/> Drainage Channel	<input type="checkbox"/> Constructed Basin	<input type="checkbox"/> Rock Basin
<input type="checkbox"/> Excavated Ditch	<input type="checkbox"/> Unvegetated Depression	<input type="checkbox"/> Other: _____

Apparent Hydrologic Regime

<input type="checkbox"/> Perennial	<input type="checkbox"/> Standing Water (Depth: _____)
<input type="checkbox"/> Intermittent	<input type="checkbox"/> Flowing Water (Depth: _____)
<input checked="" type="checkbox"/> Ephemeral	<input checked="" type="checkbox"/> Dry at time of the survey

Indicators

<input type="checkbox"/> Standing or flowing water with no indication of recent precipitation	<input type="checkbox"/> Channel adjacent to shelf with steep side	<input type="checkbox"/> Natural / irrigation / manmade / ditch flowing into feature
<input type="checkbox"/> presence of hydrophytic vegetation	<input type="checkbox"/> Natural line, stain or mineral (salt) deposit	<input type="checkbox"/> Dated picture / account showing / referring to identifiable features
<input type="checkbox"/> Presence of hydric soil with or without hydrophytic vegetation	<input type="checkbox"/> Litter, debris and or clay deposits	<input checked="" type="checkbox"/> Wetland symbol on map (presence of solid or dotted blue line, solid, shaded or stippled blue area on map)
<input checked="" type="checkbox"/> Absence of vegetation or interruption of upland vegetation	<input type="checkbox"/> Algae or alga mat	<input type="checkbox"/> Other (Specify)

Notes: SHOWN AS BLUE LINE ON USGS 7.5 MIN. TOPO FOR THE CARABASAS QUAD - NOT INCLUDED IN THE MHD

- NATURAL DRAINAGE CHANNEL

Channel Characteristics

Channel Width	14 ft	
Channel Depth	1.5 ft	
High Water Line Width <small>Low flow</small>	2 ft	
High Water Line Depth <small>Low flow</small>	6 inches	
Channel Substrate (check all that apply)		
<input checked="" type="checkbox"/> Sand	<input type="checkbox"/> Cobble	<input type="checkbox"/> Silt / Clay
<input checked="" type="checkbox"/> Gravel 10-15%	<input type="checkbox"/> Rock	<input type="checkbox"/> Other _____

Vegetation Characteristics of Channel or Basin

Vegetated Channel or Basin?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Dominant / Characteristic Species		

Vegetation Adjacent to Channel

Dominant / Characteristic Species
ERIODICTYON CRASSIFOLIUM, BACCHARIS PILULARIS,
MALACOTHAMNUS FASCICULATUS, MIMULUS AURANTIACUS,
ADENOSTOMA FASCICULATUM, Ceanothus crassifolius
TOXICODENDRON DIVERSILOBUM, PIPTATHERUM MILACEUM

Notes: NATURAL DRAINAGE CHANNEL JUST UPSTREAM
OF THE R2A POND AREA

Appendix G Representative Photographs

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G-1. Coca Pond view north. January 3, 2012.



G-2. Coca Pond view east of the stormwater basin just upstream from Coca Pond. January 3, 2012.



G-3. Coca Pond SP-2 soil pit (out). January 3, 2012



G-4. Coca Pond. Organic sediment accumulation at SP-1. January 3, 2012



G-5. Upper reaches of Coca Drainage. View upstream at Coca test stand at stream data point CD-1. January 3, 2012.



G-6. Bell Creek Tributary (Coca Drainage below Coca Pond). View east (downstream) of concrete lined ditch just below Coca Pond outlet at stream data point CD-3. January 3, 2012.



G-7. Bell Creek Tributary 3 (Drainage within Delta Area). View east (upstream) of plunge pools on stream that still had water at stream data point CD-6. January 3, 2012.



G-8. NASA Area 1. View west (uphill) of seasonal ponding feature SW-1 PEMAX. January 4, 2012



G-9. NASA Area 1. Seasonal ponding feature SW-1 P-1 soil pit (in). January 4, 2012.



G-10. NASA Area 1. Seasonal ponding feature SW-1 P-2 soil pit (out). January 4, 2012.



G-11. NASA Area 1 Impoundment Pond (PEMCh). View west showing berm that creates the impoundment pond described on stream data sheet and wetland data sheet SW-2 in northwestern portion of property. January 4, 2012



G-12. NASA Area 1 Impoundment Pond. SW-2 P-1 soil pit (in). January 4, 2012.



G-13. NASA Area 1 Impoundment Pond. SW-2 P-2 soil pit (out). January 4, 2012



G-14. NASA Area 1 Lower Drainage. View west (downstream) at stream data point ND-4. January 4, 2012.



G-15. NASA Area 2 Northeastern Drainage. View north (downstream) at stream data point SP-3. January 4, 2012



G-16. R2A Pond. View south. January 5, 2012



G-17. R2A Pond. Culvert and gated weir from R2A Pond. January 5, 2012



G-18. R2A Pond. View north. January 5, 2012



G-19. R2A Pond. Soil pit R2A SP-1 (in). January 5, 2012



G-20. R2A Pond. Soil pit R2A SP-2 (out). January 5, 2012



G-21. R2A Pond. R2A Pond Pump intake and piping for water transfers to and from Silvernale Pond. January 5, 2012



G-22. R2B Pond. Drift line of algal matting on R2B pond at 36 inches above current water level. January 5, 2012



G-23. R2B Pond. Soil pit 1 R2B SP-1 (in). January 5, 2012



G-24. R2B Pond. Location of soil pit R2B SP-2 (out) on western margin of pond. January 5, 2012



G-25. Bell Creek SW. View west (downstream) at stream data point BC-11. January 5, 2012.



G-26. Small concrete impoundment controlling flow along Bell Creek from Alfa site (view west). January 5, 2012



G-27. Bell Creek at Alfa Site. Earthen dam along Bell Creek view west-northwest. January 5, 2012



G-28. Bell Creek at Bravo Site. Culvert discharge below and north of capped pond outfall. January 5, 2012



G-29. Bell Creek at SPA Site. View west (downstream) at stream data point BC-6. January 6, 2012. [Designated in report as BC-6]



G-30. Bell Creek near CDFF Site. View north (upstream) at stream data point BC-8 above R2B Pond. January 6, 2012.



G-31. Bell Creek Tributary 1 near CDFF Site. Bell Creek at confluence. January 6, 2012



G-32. Bell Creek Tributary (PLF Site). View north into natural channel above CLORP leading to capped Delta Pond. January 6, 2012

Appendix H

Plant Species Observed

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APPENDIX H

List of Plant Species Observed

APPENDIX H

List of Plant Species Observed

Scientific Name ¹	Common Name ²	Wetland Indicator Status ³	Habit and Origin ⁴
DICOTS			
AIZOACEAE			
<i>Mesembryanthemum crystallinum</i>	Common iceplant	NL	Herb (A/P); I
ADOXACEAE			
<i>Sambucus nigra</i> ssp. <i>caerulea</i> (<i>Sambucus mexicana</i>)	American black elderberry	FACU	Shrub/Tree; N
ANACARDIACEAE			
<i>Malosoma laurina</i>	laurel sumac	NI	Shrub; N
<i>Toxicodendron diversilobum</i>	Pacific poison oak	NI	Shrub; N
ASTERACEAE			
<i>Artemisia californica</i>	coastal sagebrush	NI	Shrub; N
<i>Artemisia douglasiana</i>	Douglas' sagewort	FAC+	Herb (P); N
<i>Baccharis pilularis</i>	coyotebrush	NI	Shrub; N
<i>Baccharis salicifolia</i>	mule-fat	FACW	Shrub; N
<i>Carduus pycnocephalus</i>	Italian plumeless thistle	NI	Herb (A); I
<i>Centaurea melitensis</i>	Maltese star-thistle	NI	Herb (A/B); I
<i>Cirsium occidentale</i> var. <i>occidentale</i>	cobwebby thistle	NI	Herb (B); N
<i>Conyza canadensis</i>	Canadian horeseweed	FAC	Herb (A/B); N
<i>Heterotheca grandiflora</i>	telegraphweed	NI	Herb (A/P); N
<i>Hypochaeris glabra</i>	smooth cat's ear	NI	Herb (A); I
<i>Pseudognaphalium biolettii</i> (<i>Gnaphalium bicolor</i>)	two-color rabbit-tobacco	NI	Herb/SS (B); N
<i>Psilocarphus tenellus</i>	slender woollyheads	FAC	Herb (A); N
<i>Silybum marianum</i>	blessed milkthistle	NI	Herb (A/B); I
<i>Sonchus asper</i>	spiny sowthistle	FAC	Herb (A); I
<i>Sonchus oleraceus</i>	common sowthistle	NI	Herb (A); I
<i>Venegasia carpesioides</i>	canyon sunflower	NI	SS/Shrub; N
<i>Xanthium strumarium</i>	rough cocklebur	FAC+	Herb (A); N

APPENDIX H
List of Plant Species Observed

Scientific Name ¹	Common Name ²	Wetland Indicator Status ³	Habit and Origin ⁴
BORAGINACEAE			
<i>Cryptantha</i> sp.	cryptantha	NI	Herb (A); N
<i>Eriodictyon crassifolium</i>	thickleaf yerba santa	NI	Shrub; N
<i>Phacelia cicutaria</i>	caterpillar phacelia	NI	Herb (A); N
<i>Phacelia ramosissima</i>	branching phacelia	NI	Herb/SS (P); N
BRASSICACEAE			
<i>Brassica nigra</i>	black mustard	NI	Herb (A); I
CALLITRICHACEAE			
<i>Callitriche marginata</i>	Water starwort	OBL	Herb(A); N
CAPRIFOLIACEAE			
<i>Lonicera subspicata</i>	southern honeysuckle	NI	Shrub/Vine; N
<i>Symphoricarpos mollis</i>	creeping snowberry	NI	SS/Shrub; N
CRASSULACEAE			
<i>Crassula aquatica</i>	<i>Crassula aquatica</i>	OBL	Herb (A); N
FABACEAE			
<i>Acmispon glaber</i> (syn. <i>Lotus scoparius</i>)	common deerweed	NI	SS (P); N
<i>Vicia villosa</i>	winter vetch	NI	Herb (A/P); I
FAGACEAE			
<i>Quercus agrifolia</i>	California live oak	NI	Tree/Shrub; N
GERANIACEAE			
<i>Erodium botrys</i>	longbeak stork's bill	NI	Herb (A/B); I
GROSSULARIACEAE			
<i>Ribes malvaceum</i>	chaparral current	NI	Shrub; N
LAMIACEAE			
<i>Salvia mellifera</i>	black sage	NI	SS/Shrub; N
LAURACEAE			
<i>Umbellularia californica</i>	California laurel	FAC	Tree/Shrub; N
MALVACEAE			
<i>Malacothamnus fasciculatus</i>	Mendocino bushmallow	NI	SS/Shrub; N
MYRSINACEAE			
<i>Anagallis arvensis</i>	scarlet pimpernel	FAC	Herb (A/B); I
PHRYMACEAE			
<i>Mimulus aurantiacus</i>	orange bush monkeyflower	NI	Shrub/SS; N

APPENDIX H
List of Plant Species Observed

Scientific Name ¹	Common Name ²	Wetland Indicator Status ³	Habit and Origin ⁴
PLANTAGINACEAE			
<i>Keckiella cordifolia</i>	heartleaf Keckiella	NI	Shrub/SS; N
<i>Veronica peregrina</i>	Purslane speedwell	OBL	Herb (A); N
PLATANACEAE			
<i>Platanus racemosa</i>	California sycamore	FACW	Tree; N
POLYGONACEAE			
<i>Eriogonum fasciculatum</i> var. <i>fasciculatum</i>	Eastern Mojave buckwheat	NI	SS/Shrub; N
<i>Rumex crispus</i>	curly dock	FACW	Herb (P); I
<i>Rumex salicifolius</i>	willow dock	OBL	Herb (P); N
RHAMNACEAE			
<i>Ceanothus crassifolius</i>	hoaryleaf ceanothus	NI	Shrub; N
<i>Ceanothus oliganthus</i>	hairy ceanothus	NI	Shrub; N
<i>Ceanothus spinosus</i>	redheart	NI	Shrub; N
ROSACEAE			
<i>Adenostoma fasciculatum</i>	chamise	NI	Shrub ; N
<i>Cercocarpus betuloides</i>	birchleaf mountain mahogany	NI	Shrub/Tree; N
<i>Herteromeles arbutifolia</i>	toyon	NI	Shrub ; N
<i>Rosa californica</i>	California wildrose	FAC+	Shrub; N
<i>Rubus ursinus</i>	California blackberry	FAC+	SS (P); N
RUBIACEAE			
<i>Galium angustifolium</i>	narrowleaf bedstraw	NI	Herb/SS (P); N
<i>Galium aparine</i>	stickywilly	FACU	Herb (A); N
<i>Galium cliftonsmithii</i>	Santa Barbara bedstraw	NI	Shrub; N
<i>Galium nuttallii</i>	climbing bedstraw	NI	SS/Shrub ; N
<i>Galium parisiense</i>	wall bedstraw	FACU	Herb (A);I
SALICACEAE			
<i>Salix lasiolepis</i>	arroyo willow	FACW	Tree/Shrub; N
MONOCOTS			
CYPERACEAE			
<i>Cyperus eragrostis</i>	tall flatsedge	FACW	Graminoid (P); N
<i>Eleocharis macrostachya</i>	pale spikerush	OBL	Graminoid (P); N
<i>Schoenoplectis</i> sp.	tule	OBL	Graminoid (P); N

APPENDIX H

List of Plant Species Observed

Scientific Name ¹	Common Name ²	Wetland Indicator Status ³	Habit and Origin ⁴
JUNCACEAE			
<i>Juncus bufonius</i>	toad rush	FACW+	Graminoid (P); N
POACEAE			
<i>Avena barbata</i>	slender oat	NI	Graminoid (A); I
<i>Bromus diandrus</i>	ripgut brome	NI	Graminoid (A); I
<i>Bromus hordeaceus</i>	soft brome	NI	Graminoid (A); I
<i>Bromus madritensis ssp. rubens</i>	red brome	UPL	Graminoid (A); I
<i>Leymus condensatus</i>	giant ryegrass	FACU	Graminoid (P); N
<i>Pennisetum setaceum</i>	crimson fountaingrass	NI	Graminoid (P); I
<i>Piptatherum miliaceum</i>	smilgrass	NI	Graminoid (P); I
<i>Poa secunda</i>	Sandberg bluegrass	NI	Graminoid (P); N
<i>Polypogon monspeliensis</i>	annual rabbitsfoot grass	FACW+	Graminoid (A); I
TYPHACEAE			
<i>Typha domingensis</i>	southern cattail	OBL	Herb (P); N
<p>Notes:</p> <p>N = Native</p> <p>I = Introduced (non-native species that have become naturalized)</p> <p>(A) = Annual (B) = Biennial (P) = Perennial SS = Sub-Shrub</p> <p>1Taxonomy follows the currently accepted nomenclature for plant species occurring in California as indicated on the Jepson On-Line Interchange for California Floristics (University of California, 2011).</p> <p>2Species common name, origin and grow habitat from the U.S. Department of Agriculture's Plants Database (2011).</p> <p>3 Wetland Indicator Status is taken from 1998 National List of Plants that Occur in Wetlands (Region 0: California) (Reed, 1988)</p> <p>Wetland Indicator Status Codes:</p> <p>OBL = Obligate Wetland. Occurs with an estimated 99 probability in wetlands</p> <p>FACW = Facultative Wetland. Estimated 67 to 99 percent probability of occurrence in wetlands</p> <p>FAC = Facultative. Equally likely to occur in wetlands and non-wetlands</p> <p>NI = No indicator. Insufficient information available to determine an indicator status</p> <p>FACU = Facultative Upland. Estimated 67 to 99 percent probability of occurrence in uplands</p> <p>UPL = Obligate Upland. Occurs with an estimated 99 probability in uplands</p> <p>(+) = Positive sign indicates a frequency toward higher end of category (i.e., more frequently found in wetlands)</p> <p>(-) = Negative sign indicates a frequency toward lower end of category (i.e., more frequently found in uplands)</p>			

**G2: U.S. Army Corps of Engineers- Los Angeles District Approved Jurisdictional
Determination Regarding Presence/Absence of Geographic Jurisdiction,
February 12, 2013**

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DEPARTMENT OF THE ARMY

Los Angeles District, Corps of Engineers
Ventura Field Office
2151 Alessandro Drive, Suite 110
Ventura, CA 93001

February 12, 2013

REPLY TO
ATTENTION OF

Regulatory Division

Allen Elliot, SSFL Project Director
National Aeronautics and Space Administration
Office of Center Operations
George C. Marshall Space Flight Center
Marshall Space Flight Center, AL 35812

SUBJECT: Approved Jurisdictional Determination regarding presence/absence of geographic jurisdiction

Dear Mr. Elliot:

Reference is made to your request (File No. SPL-2012-00520-AJS) dated April 11, 2012 for an approved Department of the Army jurisdictional determination (JD) for the NASA-Administered Property at the Santa Susana Field Lab (at long: -118.698205, lat : 34.232447) located near the City of Simi Valley, Ventura County, California.

As you may know, the Corps' evaluation process for determining whether or not a Department of the Army permit is needed involves two tests. If both tests are met, then a permit is required. The first test determines whether or not the proposed project is located in a water of the United States (i.e., it is within the Corps' geographic jurisdiction). The second test determines whether or not the proposed project is a regulated activity under Section 10 of the River and Harbor Act or Section 404 of the Clean Water Act. As part of the evaluation process, pertaining to the first test only, we have made the jurisdictional determination below.

Based on available information, we have determined there are waters of the United States on the project site, as well as non-jurisdictional aquatic resources, in the locations depicted on the enclosed drawing. The Corps concurs with the findings and extent of waters of the United States and wetlands as presented in the "Wetlands and Waters of the United States, Delineation for the NASA-Administered Portions of the Santa Susana Field Laboratory, Ventura County, California" dated March 2012, with the exception of "SW-1 Pond," "Drainage A-1" and "PLF Drainage." These features consist of poorly defined swales or erosional features lacking an ordinary high water mark and thus not considered waters of the United States. The basis for our determination can be found in the enclosed JD form(s).

The aquatic resource identified as "SW-2 Pond" including the associated tributary drainage on the above drawing is an intrastate isolated water with no apparent interstate or foreign commerce connection. As such, this water is not currently regulated by the Corps of Engineers. This disclaimer of jurisdiction is only for Section 404 of the Clean Water Act. Other Federal, State, and local laws may apply to your activities. In particular, you may need authorization from the California State Water Resources Control Board and/or the U.S. Fish and Wildlife Service.

This letter contains an approved jurisdictional determination for the NASA-Administered Property at the Santa Susana Field Lab. If you object to this decision, you may

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request an administrative appeal under Corps regulations at 33 CFR Part 331. Enclosed you will find a Notification of Appeal Process (NAP) fact sheet (Appendix A) and Request for Appeal (RFA) form. If you request to appeal this decision you must submit a completed RFA form to the Corps South Pacific Division Office at the following address:

Tom Cavanaugh
Administrative Appeal Review Officer,
U.S. Army Corps of Engineers
South Pacific Division, CESPDPDS-O, 2042B
1455 Market Street, San Francisco, California 94103-1399

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 C.F.R. Part 331.5, and that it has been received by the Division Office within 60 days of the date on the NAP. Should you decide to submit an RFA form, it must be received at the above address by **April 13, 2013**. It is not necessary to submit an RFA form to the Division office if you do not object to the decision in this letter.

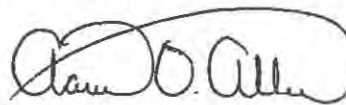
This verification is valid for five years from the date of this letter, unless new information warrants revision of the determination before the expiration date. If you wish to submit new information regarding the approved jurisdictional determination for this site, please submit this information to Antal Szijj at the letterhead address April 13, 2013. The Corps will consider any new information so submitted and respond within 60 days by either revising the prior determination, if appropriate, or reissuing the prior determination. A revised or reissued jurisdictional determination can be appealed as described above.

This determination has been conducted to identify the extent of the Corps' Clean Water Act jurisdiction on the particular project site identified in your request. This determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985. If you or your tenant are USDA program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service, prior to starting work.

If you have any questions, please contact Antal Szijj of my staff at 805-585-2147 or via e-mail at Antal.J.Szijj@usace.army.mil.

Please be advised that you can now comment on your experience with Regulatory Division by accessing the Corps web-based customer survey form at:
<http://per2.nwp.usace.army.mil/survey.html>.

Sincerely,



Aaron O. Allen
Chief, North Coast Branch
Regulatory Division

Enclosures

Cf: Steve Long, CH2M Hill

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NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: NASA		File Number: SPL-2012-520	Date: 12-Feb-2013
Attached is:		See Section below	
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A	
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B	
	PERMIT DENIAL	C	
X	APPROVED JURISDICTIONAL DETERMINATION	D	
	PRELIMINARY JURISDICTIONAL DETERMINATION	E	

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://www.usace.army.mil/gecw/page/reg_materials.asp or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **OBJECT:** If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **APPEAL:** If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- **ACCEPT:** You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- **APPEAL:** If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

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E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION

If you have questions regarding this decision and/or the appeal process you may contact:

Antal Szijj, Senior Project Manager
U.S. Army Corps of Engineers
Los Angeles District, Ventura Field Office
2151 Alessandro Dr, Suite 110
Ventura, CA 93001
Phone: (805)-585-2147 Fax (805) 585-2154
Email: antal.j.szijj@usace.army.mil

If you only have questions regarding the appeal process you may also contact: Thomas J. Cavanaugh

Administrative Appeal Review Officer,
U.S. Army Corps of Engineers
South Pacific Division
1455 Market Street, 2052B
San Francisco, California 94103-1399
Phone: (415) 503-6574 Fax: (415) 503-6646
Email: thomas.j.cavanaugh@usace.army.mil

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

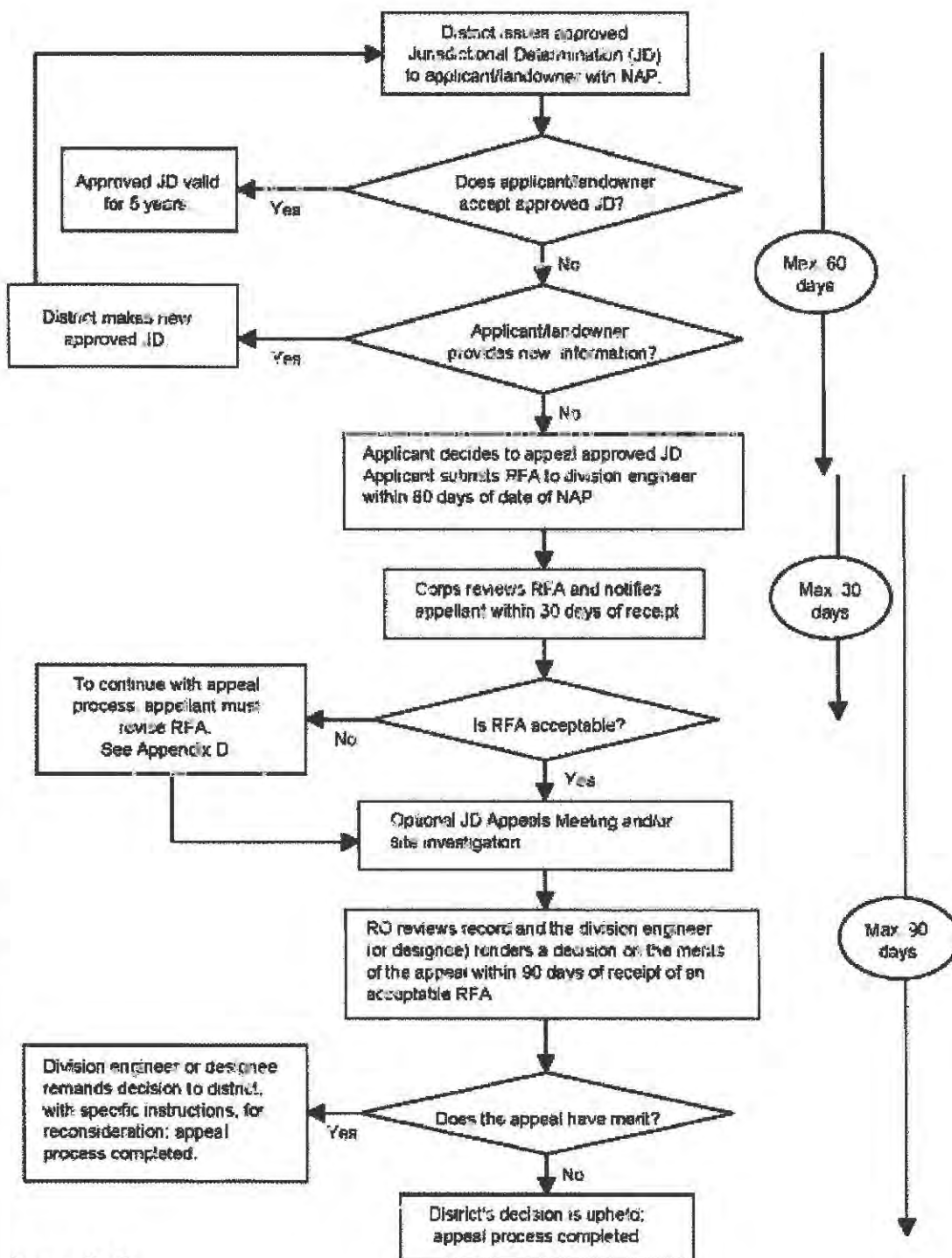
Date:

Telephone number:

Signature of appellant or agent.

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Administrative Appeal Process for Approved Jurisdictional Determinations



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APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): 01/14/2013

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: CESPL-RG-N, Ventura Field Office; SSFL NASA Property Delineation; File no. SPL-2012-520-AJS: Southwestern Drainage tributary

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: CA County/parish/borough: Ventura City: unincorporated (SSFL)
 Center coordinates of site (lat/long in degree decimal format): Lat. 32.2279° N Long. 118.7080° W
 Universal Transverse Mercator:

Name of nearest waterbody: Bell Creek

Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Los Angeles River

Name of watershed or Hydrologic Unit Code (HUC): Los Angeles River (18070105)

☒ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.

☒ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc...) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☒ Office (Desk) Determination. Date: 09/12/2012

☒ Field Determination. Date(s): Jan 2012

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There ~~are~~ **are** "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [Required]

☒ Waters subject to the ebb and flow of the tide.

☒ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.
 Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There ~~are~~ **are** "waters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [Required]

1. Waters of the U.S.

a. Indicate presence of waters of U.S. in review area (check all that apply):¹

- ☒ TNWs, including territorial seas
- ☒ Wetlands adjacent to TNWs
- ☒ Relatively permanent waters² (RPWs) that flow directly or indirectly into TNWs
- ☒ Non-RPWs that flow directly or indirectly into TNWs
- ☒ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
- ☒ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
- ☒ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
- ☒ Impoundments of jurisdictional waters
- ☒ Isolated (interstate or intrastate) waters, including isolated wetlands

b. Identify (estimate) size of waters of the U.S. in the review area:

Non-wetland waters: 1300 linear feet; 2 width (ft) and/or acres.

Wetlands: acres.

c. Limits (boundaries) of jurisdiction based on: Established by OHWM

Elevation of established OHWM (if known):

2. Non-regulated waters/wetlands (check if applicable):³

☒ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional.
 Explain:

¹ Boxes checked below shall be supported by completing the appropriate sections in Section III below.

² For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).

³ Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS**A. TNWs AND WETLANDS ADJACENT TO TNWs**

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW

Identify TNW:

Summarize rationale supporting determination:

2. Wetland adjacent to TNW

Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody⁴ is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW**(i) General Area Conditions:**

Watershed size: 37 square miles
 Drainage area: 40 square miles
 Average annual rainfall: 19 inches
 Average annual snowfall: 0 inches

(ii) Physical Characteristics:**(a) Relationship with TNW:**

- ☐ Tributary flows directly into TNW.
☒ Tributary flows through 3 tributaries before entering TNW.

Project waters are 5-10 river miles from TNW.
 Project waters are 1 (or less) river miles from RPW.
 Project waters are 3-10 aerial (straight) miles from TNW.
 Project waters are 1 (or less) aerial (straight) miles from RPW.
 Project waters cross or serve as state boundaries. Explain: n/a.

⁴ Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

Identify flow route to TNW⁵: Upper Southwestern Drainage flows into R2A Pond, thence to Bell Canyon Channel (natural), thence to the channelized section of lower Bell Canyon. The downstream TNW is upper end of the Los Angeles River, at the confluence of Bell Canyon Channel and Arroyo Calabasas.
Tributary stream order, if known:

(b) General Tributary Characteristics (check all that apply):

Tributary is: ☐ Natural
☐ Artificial (man-made). Explain:
☒ Manipulated (man-altered). Explain: culvert, shotcrete swales, water control weirs and impoundments present.

Tributary properties with respect to top of bank (estimate):

Average width: 4-5 feet
Average depth: 1 foot
Average side slopes: 2:1

Primary tributary substrate composition (check all that apply):

☒ Silts ☒ Sands ☒ Concrete
☐ Cobbles ☐ Gravel ☐ Muck
☐ Bedrock ☐ Vegetation. Type/% cover:
☐ Other. Explain:

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: some incision evident.

Presence of run/riffle/pool complexes. Explain: n/a.

Tributary geometry: Standardizing

Tributary gradient (approximate average slope): 1 %

(c) Flow:

Tributary provides for: ephemeral ~~flow~~

Estimate average number of flow events in review area/year: 2-5

Describe flow regime: ephemeral.

Other information on duration and volume: Channel previously affected by discharges from SSFL test operations requiring cooling water (no longer conducted). Channel and downstream impoundments acted to collect cooling water discharges during rocket engine testing.

Surface flow is: Confined. Characteristics:

Subsurface flow: Unknown. Explain findings:

☐ Dye (or other) test performed:

Tributary has (check all that apply):

☒ Bed and banks
☒ OHWM⁶ (check all indicators that apply):
☒ clear, natural line impressed on the bank ☐ the presence of litter and debris
☐ changes in the character of soil ☐ destruction of terrestrial vegetation
☐ shelving ☐ the presence of wrack line
☐ vegetation matted down, bent, or absent ☐ sediment sorting
☐ leaf litter disturbed or washed away ☐ scour
☐ sediment deposition ☐ multiple observed or predicted flow events
☐ water staining ☐ abrupt change in plant community
☐ other (list):
☐ Discontinuous OHWM.⁷ Explain:

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):

☒ High Tide Line indicated by: ☐ Mean High Water Mark indicated by:
☐ oil or scum line along shore objects ☐ survey to available datum;
☐ fine shell or debris deposits (foreshore) ☐ physical markings;
☐ physical markings/characteristics ☐ vegetation lines/changes in vegetation types.
☐ tidal gauges
☐ other (list):

⁵ Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

⁶ A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.

⁷ Ibid.

(iii) Chemical Characteristics:

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).

Explain: water not present at time of delineation.

Identify specific pollutants, if known: heavy metals.

(iv) Biological Characteristics. Channel supports (check all that apply):

- ☐ Riparian corridor. Characteristics (type, average width): lower reach support mulefat and arroyo willow.
- ☐ Wetland fringe. Characteristics:
- ☐ Habitat for:
- ☐ Federally Listed species. Explain findings:
- ☐ Fish/spawn areas. Explain findings:
- ☐ Other environmentally-sensitive species. Explain findings:
- ☐ Aquatic/wildlife diversity. Explain findings:

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW**(i) Physical Characteristics:****(a) General Wetland Characteristics:****Properties:**

Wetland size: acres

Wetland type. Explain: .

Wetland quality. Explain:

Project wetlands cross or serve as state boundaries. Explain:

(b) General Flow Relationship with Non-TNW:Flow is: Pick List. Explain: surface water only present in impounded areas.Surface flow is: Pick List

Characteristics:

Subsurface flow: Pick List. Explain findings:☐ Dye (or other) test performed:**(c) Wetland Adjacency Determination with Non-TNW:**☐ Directly abutting☐ Not directly abutting☐ Discrete wetland hydrologic connection. Explain:☐ Ecological connection. Explain:☐ Separated by berm/barrier. Explain:**(d) Proximity (Relationship) to TNW**Project wetlands are Pick List river miles from TNW.Project waters are Pick List aerial (straight) miles from TNW.Flow is from: Pick List.Estimate approximate location of wetland as within the Pick List floodplain.**(ii) Chemical Characteristics:**

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain:

Identify specific pollutants, if known:

(iii) Biological Characteristics. Wetland supports (check all that apply):☐ Riparian buffer. Characteristics (type, average width):2.☐ Vegetation type/percent cover. Explain: .☐ Habitat for:☐ Federally Listed species. Explain findings:☐ Fish/spawn areas. Explain findings:☐ Other environmentally-sensitive species. Explain findings:☐ Aquatic/wildlife diversity. Explain findings:**3. Characteristics of all wetlands adjacent to the tributary (if any)**All wetland(s) being considered in the cumulative analysis: Pick List

Approximately () acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)

Size (in acres)

Directly abuts? (Y/N)

Size (in acres)

Summarize overall biological, chemical and physical functions being performed:

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D: The subject tributary is a small ephemeral drainage with a narrow (approx 2-3 foot) but well-defined ordinary high water mark. The channel itself is largely unvegetated, but adjacent uplands include coast live oak, ceanothus, coyotebrush and chamise. The tributary drains an area that supported the Systems Test Laboratory facilities. Flows are eventually conveyed to the "southwestern drainage" prior to entering a secondary holding pond and thence to Bell Canyon Channel. The downstream TNW (upper reach of the Los Angeles River) is approximately 8 miles downstream. The total drainage area of the tributary represents approximately 0.002% of the watershed draining to the downstream TNW. Soil testing within the channel and surrounding watershed have revealed elevated levels of heavy metals (lead, cadmium, copper and/or mercury). Bell Canyon Channel, inclusive of the reach within the review area, is included on the list 303(d) impaired waterbodies due to bacterial contamination. The tributary therefore has a significant nexus to the downstream TNW by virtue of its potential to deliver contaminants downstream.
2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:
3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: Wetlands present are palustrine in nature as the result of impoundments of tributary. Flow and potential pollutants would be conveyed through wetland, therefore the wetlands in question have a significant nexus to the downstream TNW.

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
☐ TNWs: linear feet width (ft), Or, acres.
☐ Wetlands adjacent to TNWs: acres.

2. RPWs that flow directly or indirectly into TNWs.

- ☒ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial:
- ☒ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:

Provide estimates for jurisdictional waters in the review area (check all that apply):

- ☒ Tributary waters: linear feet width (ft).
☒ Other non-wetland waters: acres.
 Identify type(s) of waters: .

3. Non-RPWs⁸ that flow directly or indirectly into TNWs.

- ☒ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

- ☒ Tributary waters: 1,300 linear feet; 3 width (ft).
☒ Other non-wetland waters: acres.
 Identify type(s) of waters: .

4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.

- ☒ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
- ☒ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .
- ☒ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.

- ☒ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.

- ☒ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: 0.64 acres.

7. Impoundments of jurisdictional waters.⁹

As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.

- ☒ Demonstrate that impoundment was created from "waters of the U.S.," or
☒ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
☒ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):¹⁰

⁸See Footnote # 3.

⁹To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

- ☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.
- ☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
- ☐ which are or could be used for industrial purposes by industries in interstate commerce.
- ☐ Interstate isolated waters. Explain:
- ☐ Other factors. Explain:

Identify water body and summarize rationale supporting determination:

Provide estimates for jurisdictional waters in the review area (check all that apply):

- ☐ Tributary waters: linear feet width (ft).
- ☐ Other non-wetland waters: acres.
- Identify type(s) of waters:
- ☐ Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

- ☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
- ☐ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
 - ☐ Prior to the Jan 2001 Supreme Court decision in "SWANCC," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
- ☐ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain:
- ☐ Other: (explain, if not covered above):

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

- ☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
- ☐ Lakes/ponds: 0.155 acres.
- ☐ Other non-wetland waters: acres. List type of aquatic resource:
- ☐ Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

- ☐ Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
- ☐ Lakes/ponds: acres.
- ☐ Other non-wetland waters: acres. List type of aquatic resource:
- ☐ Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):

- ☐ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant:
- ☐ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
 - ☒ Office concurs with data sheets/delineation report.
 - ☐ Office does not concur with data sheets/delineation report.
- ☐ Data sheets prepared by the Corps:
- ☐ Corps navigable waters' study:
- ☐ U.S. Geological Survey Hydrologic Atlas:
 - ☐ USGS NHD data.
 - ☐ USGS 8 and 12 digit HUC maps.
- ☐ U.S. Geological Survey map(s). Cite scale & quad name:
- ☐ USDA Natural Resources Conservation Service Soil Survey. Citation:
- ☐ National wetlands inventory map(s). Cite name:
- ☐ State/Local wetland inventory map(s):
- ☐ FEMA/FIRM maps:
- ☐ 100-year Floodplain Elevation is: (National Geodetic Vertical Datum of 1929)
- ☐ Photographs: ☐ Aerial (Name & Date):

¹⁹ Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA Memorandum Regarding CWA Act Jurisdiction Following Rapanos.

or ☐ Other (Name & Date):

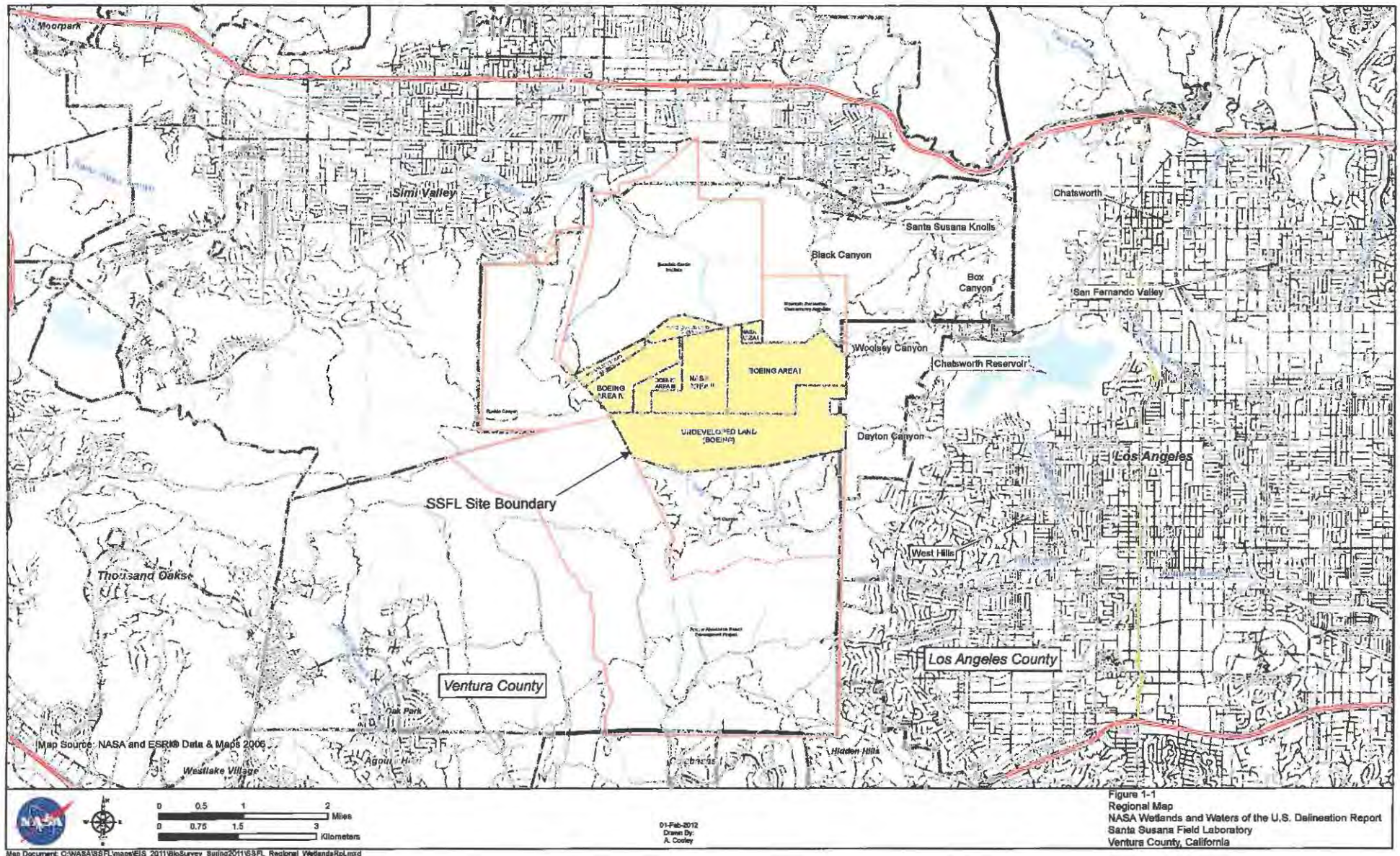
Previous determination(s). File no. and date of response letter:

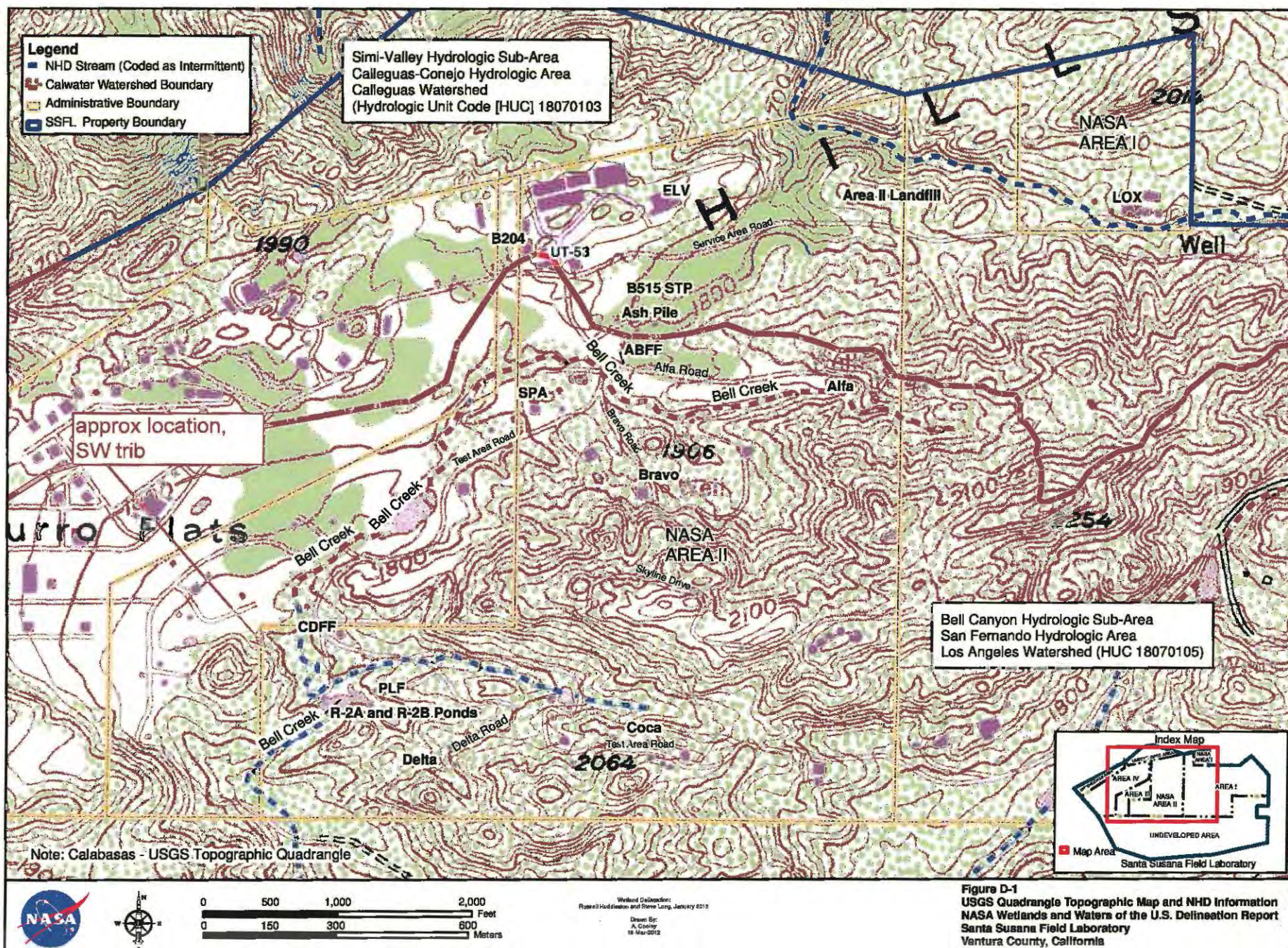
Applicable/supporting case law:

Applicable/supporting scientific literature:

Other information (please specify):

B. ADDITIONAL COMMENTS TO SUPPORT JD: The subject tributary is a small first order drainage channel with an average OHWM width of 2-3 feet. The drainage area is roughly 40 acres. Soil sampling within the drainage area has identified elevated levels of heavy metals and dioxin. Based on these results, the subject tributary appears to have a significant nexus to the downstream TNW (upper Los Angeles River, approximately 8 river miles downstream) based on the potential to deliver contaminants downstream.







APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): 09/12/2012

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: CESPL-RG-N, Ventura Field Office; SSFL NASA Property Delineation; File no. SPL-2012-520-AJS: Upper Bell Creek (aka Southwestern Drainage)

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: CA County/parish/borough: Ventura City: unincorporated (SSFL)
 Center coordinates of site (lat/long in degree decimal format): Lat. 32.23245° N, Long. 118.6982° W
 Universal Transverse Mercator:

Name of nearest waterbody: Bell Creek

Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Los Angeles River

Name of watershed or Hydrologic Unit Code (HUC): Los Angeles River (18070105)

☒ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.

☒ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc...) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☒ Office (Desk) Determination. Date: 09/12/2012

☒ Field Determination. Date(s): Jan 2012

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There ☒ "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [Required]

☒ Waters subject to the ebb and flow of the tide.

☒ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.
 Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There ☒ "waters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [Required]

1. Waters of the U.S.

a. Indicate presence of waters of U.S. in review area (check all that apply):¹

- ☒ TNWs, including territorial seas
- ☒ Wetlands adjacent to TNWs
- ☒ Relatively permanent waters² (RPWs) that flow directly or indirectly into TNWs
- ☒ Non-RPWs that flow directly or indirectly into TNWs
- ☒ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
- ☒ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
- ☒ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
- ☒ Impoundments of jurisdictional waters
- ☒ Isolated (interstate or intrastate) waters, including isolated wetlands

b. Identify (estimate) size of waters of the U.S. in the review area:

Non-wetland waters: 13200 linear feet: 5 width (ft) and/or 1.52 acres.

Wetlands: 0.64 acres.

c. Limits (boundaries) of jurisdiction based on: Established by OHWM

Elevation of established OHWM (if known):

2. Non-regulated waters/wetlands (check if applicable):³

☒ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional.
 Explain:

¹ Boxes checked below shall be supported by completing the appropriate sections in Section III below.

² For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).

³ Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS**A. TNWs AND WETLANDS ADJACENT TO TNWs**

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW

Identify TNW: .

Summarize rationale supporting determination:

2. Wetland adjacent to TNW

Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. **Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.**

If the waterbody⁴ is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW**(i) General Area Conditions:**

Watershed size: 37 ~~square miles~~

Drainage area: 1060 ~~acres~~

Average annual rainfall: 19 inches

Average annual snowfall: 0 inches

(ii) Physical Characteristics:**(a) Relationship with TNW:**

☐ Tributary flows directly into TNW.

☒ Tributary flows through 3 tributaries before entering TNW.

Project waters are 5-10 river miles from TNW.

Project waters are 1 (0 ~~less~~) river miles from RPW.

Project waters are 7-10 aerial (straight) miles from TNW.

Project waters are 1 (0 ~~less~~) aerial (straight) miles from RPW.

Project waters cross or serve as state boundaries. Explain: n/a.

⁴ Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

Identify flow route to TNW⁵: Upper Southwestern Drainage flows into R2A Pond, thence to Bell Canyon Channel (natural), thence to the channelized section of lower Bell Canyon. The downstream TNW is upper end of the Los Angeles River, at the confluence of Bell Canyon Channel and Arroyo Calabasas.

Tributary stream order, if known:

(b) General Tributary Characteristics (check all that apply):

Tributary is:

☐ Natural

☐ Artificial (man-made). Explain:

☒ Manipulated (man-altered). Explain: culvert, shotcrete swales, water control weirs and

impoundments present.

Tributary properties with respect to top of bank (estimate):

Average width: 4-5 feet

Average depth: 1 foot

Average side slopes: 2:1

Primary tributary substrate composition (check all that apply):

☒ Silts

☒ Sands

☒ Concrete

☐ Cobbles

☐ Gravel

☐ Muck

☐ Bedrock

☐ Vegetation. Type/% cover:

☐ Other. Explain:

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: some incision evident.

Presence of run/riffle/pool complexes. Explain: n/a.

Tributary geometry: Meandering

Tributary gradient (approximate average slope): 1 %

(c) Flow:

Tributary provides for: ephemeral flow

Estimate average number of flow events in review area/year: 25

Describe flow regime: ephemeral.

Other information on duration and volume: Channel previously affected by discharges from SSFL test operations requiring cooling water (no longer conducted). Channel and downstream impoundments acted to collect cooling water discharges during rocket engine testing.

Surface flow is: Discrete and confined. Characteristics:

Subsurface flow: Unknown. Explain findings:

☐ Dye (or other) test performed:

Tributary has (check all that apply):

☒ Bed and banks

☒ OHWM⁶ (check all indicators that apply):

☐ clear, natural line impressed on the bank

☐ changes in the character of soil

☒ shelving

☐ vegetation matted down, bent, or absent

☐ leaf litter disturbed or washed away

☐ sediment deposition

☒ water staining

☐ other (list):

☐ Discontinuous OHWM.⁷ Explain:

☒ the presence of litter and debris

☐ destruction of terrestrial vegetation

☐ the presence of wrack line

☐ sediment sorting

☐ scour

☐ multiple observed or predicted flow events

☐ abrupt change in plant community

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):

☒ High Tide Line indicated by:

☐ oil or scum line along shore objects

☐ fine shell or debris deposits (foreshore)

☐ physical markings/characteristics

☐ tidal gauges

☐ other (list):

☐ Mean High Water Mark indicated by:

☐ survey to available datum;

☐ physical markings;

☐ vegetation lines/changes in vegetation types.

⁵ Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

⁶ A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.

⁷ Ibid.

(iii) Chemical Characteristics:

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).

Explain: water not present at time of delineation.

Identify specific pollutants, if known: heavy metals.

(iv) Biological Characteristics. Channel supports (check all that apply):

- ☒ Riparian corridor. Characteristics (type, average width): lower reach support mulefat and arroyo willow.
- ☐ Wetland fringe. Characteristics:
- ☐ Habitat for:
- ☐ Federally Listed species. Explain findings:
- ☐ Fish/spawn areas. Explain findings:
- ☐ Other environmentally-sensitive species. Explain findings:
- ☐ Aquatic/wildlife diversity. Explain findings:

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW**(i) Physical Characteristics:****(a) General Wetland Characteristics:**

Properties:

Wetland size: 0.64 acres

Wetland type. Explain: palustrine.

Wetland quality. Explain: poor. formed as a result of 2 impoundments (0.51 and 0.13 acre respectively) intened to collect runoff from testing operations (no longer conducted). An additional impoundment area outside the review area (Boeing property) is also present and likely supports similar degraded palustrine wetlands.

Project wetlands cross or serve as state boundaries. Explain: n/a.

(b) General Flow Relationship with Non-TNW:Flow is: ephemeral flow. Explain: surface water only present in impounded areas.Surface flow is: Not present

Characteristics:

Subsurface flow: Unknown. Explain findings:☐ Dye (or other) test performed:**(c) Wetland Adjacency Determination with Non-TNW:**☒ Directly abutting☐ Not directly abutting☐ Discrete wetland hydrologic connection. Explain:☐ Ecological connection. Explain:☐ Separated by berm/barrier. Explain:**(d) Proximity (Relationship) to TNW**Project wetlands are 5-10 river miles from TNW.Project waters are 5-10 aerial (straight) miles from TNW.Flow is from: Wetland to navigable waters.Estimate approximate location of wetland as within the 2-year or less floodplain.**(ii) Chemical Characteristics:**

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: dry at time of delineation.

Identify specific pollutants, if known: heavy metals detected downstream.

(iii) Biological Characteristics. Wetland supports (check all that apply):☐ Riparian buffer. Characteristics (type, average width):2.

☒ Vegetation type/percent cover. Explain: Open water area varies depending on inundation. Fringe area supports Typha sp. and sparse mulefat and arroyo willow.

☐ Habitat for:☐ Federally Listed species. Explain findings:☐ Fish/spawn areas. Explain findings:☐ Other environmentally-sensitive species. Explain findings:☐ Aquatic/wildlife diversity. Explain findings:**3. Characteristics of all wetlands adjacent to the tributary (if any)**All wetland(s) being considered in the cumulative analysis: 2

Approximately (.64) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

<u>Directly abuts? (Y/N)</u>	<u>Size (in acres)</u>	<u>Directly abuts? (Y/N)</u>	<u>Size (in acres)</u>
y	0.13	y	0.51

Summarize overall biological, chemical and physical functions being performed: 1 very small impoundment area with managed hydrology. Dominated by Typha sp. and unvegetated open water (dry at time of delineation). A second, larger impoundment occurs immediately downstream also collecting flow from the COCA drain and PLV drain. Impoundments were originally constructed to collect runoff from testing operations, which may also contain contaminants. An additional impoundment along flow route likely supports palustrine fringe wetlands, however this was outside the assessment area.

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D: ,
2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: The subject tributary is a small ephemeral drainage with a discontinuous ordinary high water mark averaging 4-5 feet in width. The tributary includes concrete-lined sections and flow control weirs. Historically, the channel functioned to collect and convey runoff from adjacent rocket engine test stands that require substantial amounts of cooling water during testing. Flows are eventually conveyed to a holding pond off the NASA property (Boeing property) and thence to a secondary pond and thence to Bell Canyon Channel. The downstream TNW (upper reach of the Los Angeles River) is approximately 8 miles downstream. The total drainage area of the tributary represents approximately 2% of the watershed draining to the downstream TNW. Soil testing within the channel and surrounding watershed have revealed elevated levels of heavy metals (lead, cadmium, copper and/or mercury). Bell Canyon Channel, inclusive of the reach within the review area, is included on the list 303(d) impaired waterbodies due to bacterial contamination. The tributary therefore has a significant nexus to the downstream TNW by virtue of its potential to deliver contaminants downstream.
3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: Wetlands present are palustrine in nature as the result of impoundments of tributary. Flow and potential pollutants would be conveyed through wetland, therefore the wetlands in question have a significant nexus to the downstream TNW.

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:

- ☐ TNWs: linear feet width (ft), Or, acres.
☐ Wetlands adjacent to TNWs: acres.

2. **RPWs that flow directly or indirectly into TNWs.**

- ☐ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial:
☐ Tributaries of TNW where tributaries have continuous flow: "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:

Provide estimates for jurisdictional waters in the review area (check all that apply):

- ☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
 Identify type(s) of waters:

3. **Non-RPWs⁸ that flow directly or indirectly into TNWs.**

- ☒ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

- ☒ Tributary waters: 10200 linear feet; 5 width (ft).
☐ Other non-wetland waters: acres.
 Identify type(s) of waters:

4. **Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.**

- ☐ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:
☐ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. **Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.**

- ☐ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. **Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.**

- ☒ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: 0.64 acres.

7. **Impoundments of jurisdictional waters.⁹**

As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.

- ☐ Demonstrate that impoundment was created from "waters of the U.S.," or
☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

⁸See Footnote # 3.

⁹To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):¹⁰

- ☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.
☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
☐ which are or could be used for industrial purposes by industries in interstate commerce.
☐ Interstate isolated waters. Explain: _____
☐ Other factors. Explain: _____

Identify water body and summarize rationale supporting determination: _____

Provide estimates for jurisdictional waters in the review area (check all that apply):

- ☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
 Identify type(s) of waters: _____
☐ Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

- ☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
☐ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
☐ Prior to the Jan 2001 Supreme Court decision in "SWANCC," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
☐ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain: _____
☐ Other: (explain, if not covered above): _____

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

- ☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
☐ Lakes/ponds: 0.155 acres.
☐ Other non-wetland waters: acres. List type of aquatic resource: _____
☐ Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

- ☐ Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource: _____
☐ Wetlands: acres.

SECTION IV: DATA SOURCES.

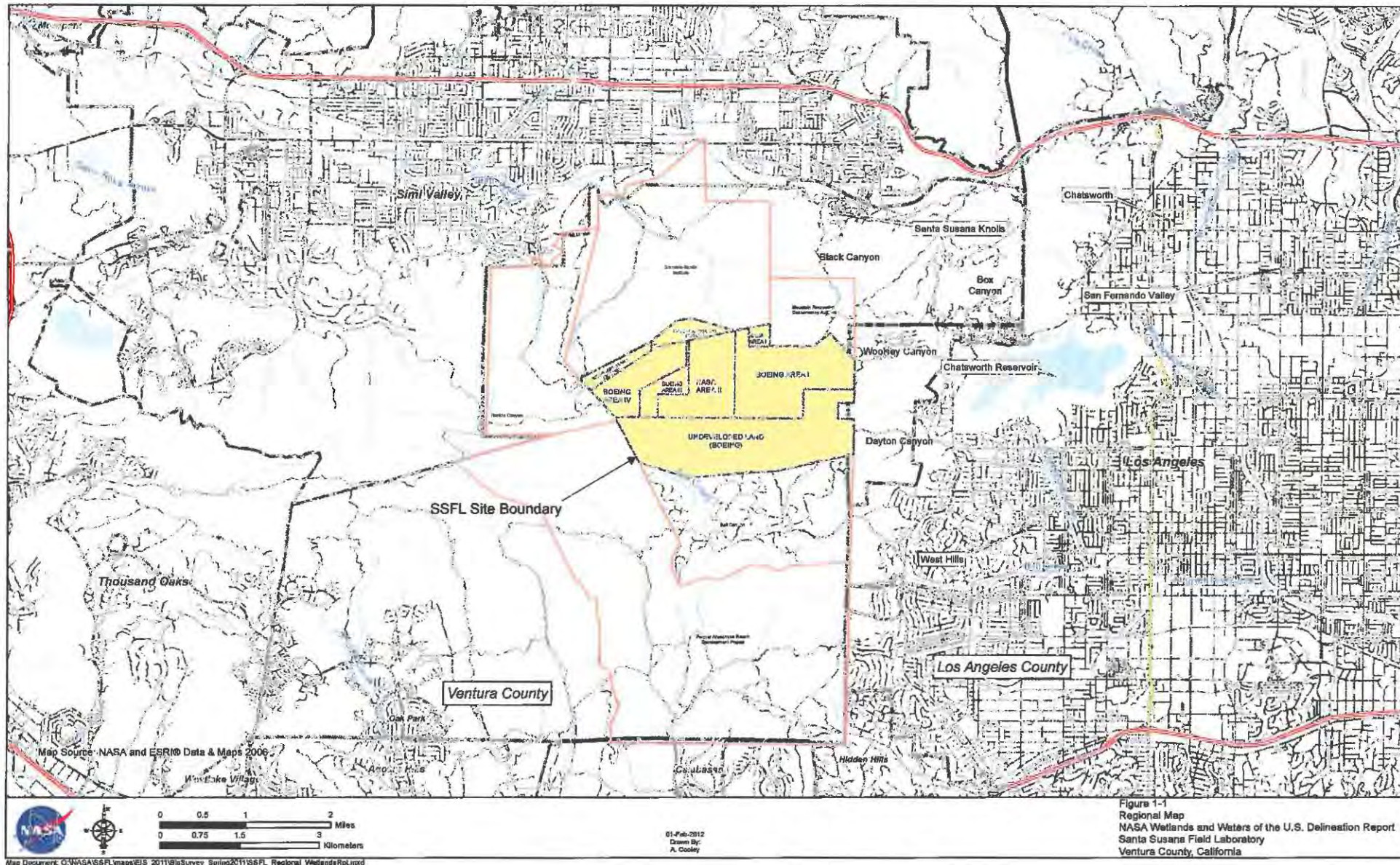
A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):

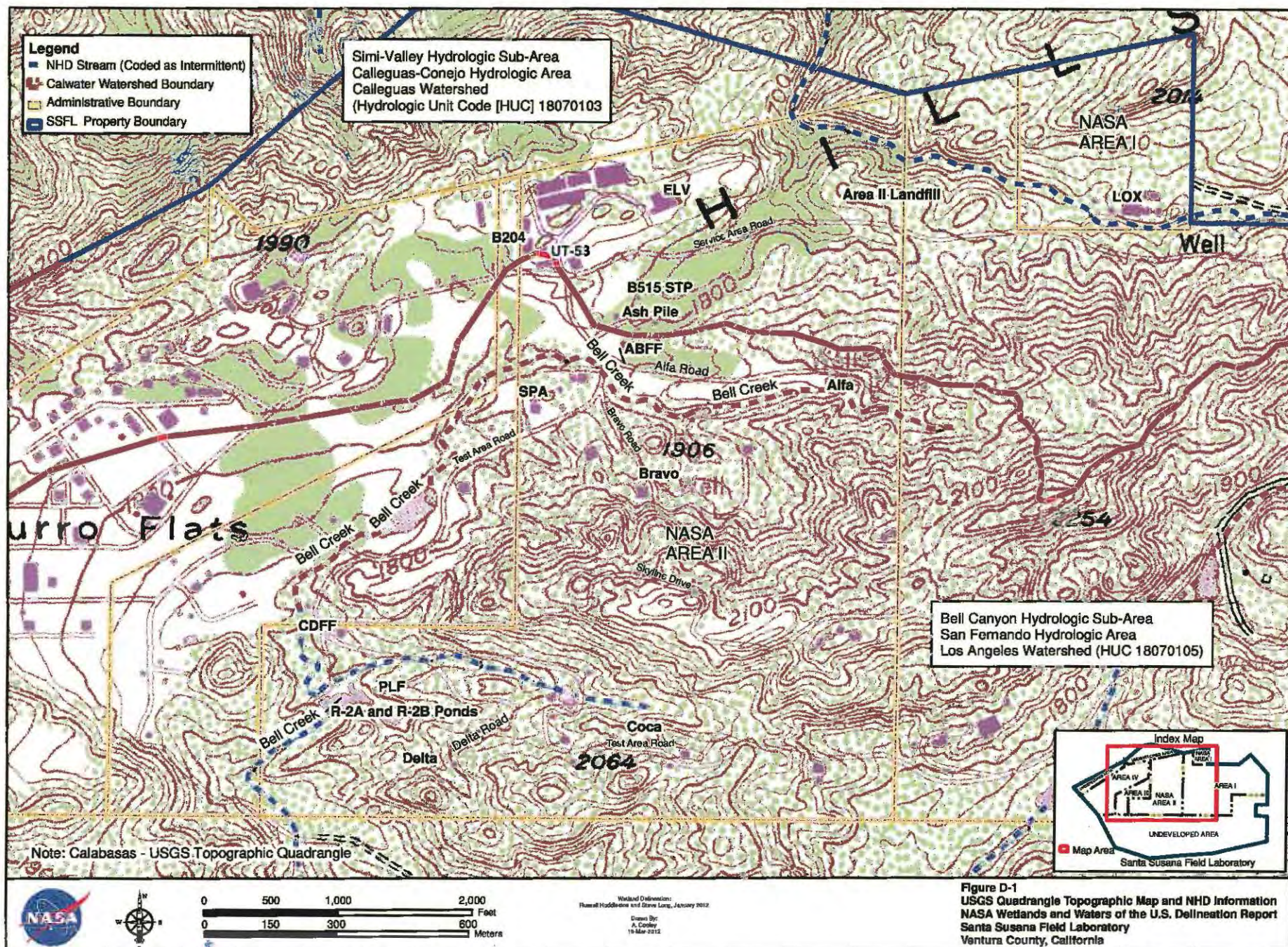
- ☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant:
☒ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
☒ Office concurs with data sheets/delineation report.
☐ Office does not concur with data sheets/delineation report.
☐ Data sheets prepared by the Corps:
☐ Corps navigable waters' study:
☐ U.S. Geological Survey Hydrologic Atlas:
☐ USGS NHD data.
☐ USGS 8 and 12 digit HUC maps.
☐ U.S. Geological Survey map(s). Cite scale & quad name: _____
☐ USDA Natural Resources Conservation Service Soil Survey. Citation: _____
☐ National wetlands inventory map(s). Cite name: _____

¹⁰ Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA Memorandum Regarding CWA Act Jurisdiction Following Rapanos.

- ☐ State/Local wetland inventory map(s):
- ☐ FEMA/FIRM maps:
- ☐ 100-year Floodplain Elevation is: (National Geodetic Vertical Datum of 1929)
- ☐ Photographs: ☐ Aerial (Name & Date):
or ☐ Other (Name & Date):
- ☐ Previous determination(s). File no. and date of response letter: .
- ☐ Applicable/supporting case law: .
- ☐ Applicable/supporting scientific literature:
- ☐ Other information (please specify): .

B. ADDITIONAL COMMENTS TO SUPPORT JD: The subject tributary is a small first order drainage channel with an average OHWM width of 4-5 feet. The drainage area is roughly 1,060 acres. Soil sampling within the drainage area has identified elevated levels of heavy metals and dioxin. Based on these results, the subject tributary appears to have a significant nexus to the downstream TNW (upper Los Angeles River, approximately 8 river miles downstream) based on the potential to deliver contaminants downstream.







APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): 11/15/2012

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: CESPL-RG-N, Ventura Field Office, SSFL NASA Property Delineation; file no. SPL-2012-520-AJS: SW-2 Pond

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: CA County/parish/borough: Ventura City: unincorporated (SSFL)
 Center coordinates of site (lat/long in degree decimal format): Lat. 34.2389° N Long. 118.6892° W
 Universal Transverse Mercator:

Name of nearest waterbody: SW-2 Pond

Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: n/a (isolated)

Name of watershed or Hydrologic Unit Code (HUC): Calleguas Creek (18070103)

☒ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.

☒ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc...) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☒ Office (Desk) Determination. Date: 01/09/2013

☒ Field Determination. Date(s): 12/20/2012

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There ~~are~~ **are** "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [Required]

☐ Waters subject to the ebb and flow of the tide.

☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.
 Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There ~~are~~ **are** "waters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [Required]

1. Waters of the U.S.

a. Indicate presence of waters of U.S. in review area (check all that apply):¹

- ☐ TNWs, including territorial seas
- ☐ Wetlands adjacent to TNWs
- ☐ Relatively permanent waters² (RPWs) that flow directly or indirectly into TNWs
- ☐ Non-RPWs that flow directly or indirectly into TNWs
- ☐ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
- ☐ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
- ☐ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
- ☐ Impoundments of jurisdictional waters
- ☐ Isolated (interstate or intrastate) waters, including isolated wetlands

b. Identify (estimate) size of waters of the U.S. in the review area:

Non-wetland waters: linear feet: width (ft) and/or acres.
 Wetlands: acres.

c. Limits (boundaries) of jurisdiction based on: Field

Elevation of established OHWM (if known):

2. Non-regulated waters/wetlands (check if applicable):³

- ☒ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional.
 Explain: Pond appears to be isolated based on field observations and site topography.

¹ Boxes checked below shall be supported by completing the appropriate sections in Section III below.

² For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).

³ Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS**A. TNWs AND WETLANDS ADJACENT TO TNWs**

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1, only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW

Identify TNW: _____

Summarize rationale supporting determination: _____

2. Wetland adjacent to TNW

Summarize rationale supporting conclusion that wetland is "adjacent": _____

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody⁴ is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW**(i) General Area Conditions:**

Watershed size: Pick List

Drainage area: Pick List

Average annual rainfall: _____ inches

Average annual snowfall: _____ inches

(ii) Physical Characteristics:**(a) Relationship with TNW:**

☐ Tributary flows directly into TNW.

☐ Tributary flows through Pick List tributaries before entering TNW.

Project waters are Pick List river miles from TNW.

Project waters are Pick List river miles from RPW.

Project waters are Pick List aerial (straight) miles from TNW.

Project waters are Pick List aerial (straight) miles from RPW.

Project waters cross or serve as state boundaries. Explain: _____

Identify flow route to TNW⁵: _____

Tributary stream order, if known: _____

⁴ Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

⁵ Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

(b) General Tributary Characteristics (check all that apply):

Tributary is: ☐ Natural
☐ Artificial (man-made). Explain:
☐ Manipulated (man-altered). Explain:

Tributary properties with respect to top of bank (estimate):

Average width: feet
 Average depth: feet
 Average side slopes: Pick List

Primary tributary substrate composition (check all that apply):

☐ Silts ☐ Sands ☐ Concrete
☐ Cobbles ☐ Gravel ☐ Muck
☐ Bedrock ☐ Vegetation. Type/% cover:
☐ Other. Explain:

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain:

Presence of run/riffle/pool complexes. Explain:

Tributary geometry: Pick List

Tributary gradient (approximate average slope): %

(c) Flow:

Tributary provides for: Pick List

Estimate average number of flow events in review area/year: Pick List

Describe flow regime:

Other information on duration and volume:

Surface flow is: Pick List. Characteristics:

Subsurface flow: Pick List. Explain findings:

☐ Dye (or other) test performed:

Tributary has (check all that apply):

☐ Bed and banks
☐ OHWM⁶ (check all indicators that apply):
☐ clear, natural line impressed on the bank ☐ the presence of litter and debris
☐ changes in the character of soil ☐ destruction of terrestrial vegetation
☐ shelving ☐ the presence of wrack line
☐ vegetation matted down, bent, or absent ☐ sediment sorting
☐ leaf litter disturbed or washed away ☐ scour
☐ sediment deposition ☐ multiple observed or predicted flow events
☐ water staining ☐ abrupt change in plant community
☐ other (list):
☐ Discontinuous OHWM.⁷ Explain:

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):

☐ High Tide Line indicated by: ☐ Mean High Water Mark indicated by:
☐ oil or scum line along shore objects ☐ survey to available datum;
☐ fine shell or debris deposits (foreshore) ☐ physical markings;
☐ physical markings/characteristics ☐ vegetation lines/changes in vegetation types.
☐ tidal gauges
☐ other (list):

(iii) Chemical Characteristics:

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).

Explain:

Identify specific pollutants, if known:

⁶A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.

⁷Ibid.

Provide estimates for jurisdictional waters in the review area (check all that apply):

- ☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
 Identify type(s) of waters: .

3. Non-RPWs⁸ that flow directly or indirectly into TNWs.

- ☐ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

- ☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
 Identify type(s) of waters: .

4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.

- ☐ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .
☐ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.

- ☐ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.

- ☐ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres.

7. Impoundments of jurisdictional waters.⁹

As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.

- ☐ Demonstrate that impoundment was created from "waters of the U.S.," or
☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):¹⁰

- ☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.
☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
☐ which are or could be used for industrial purposes by industries in interstate commerce.
☐ Interstate isolated waters. Explain: .
☐ Other factors. Explain: .

Identify water body and summarize rationale supporting determination:

⁸See Footnote # 3.

⁹To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

¹⁰ Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA Memorandum Regarding CWA Act Jurisdiction Following Rapanos.

Provide estimates for jurisdictional waters in the review area (check all that apply):

- ☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
 Identify type(s) of waters: .
☐ Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

- ☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
☐ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
☒ Prior to the Jan 2001 Supreme Court decision in "SWANCC," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
☐ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain: .
☐ Other: (explain, if not covered above): .

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

- ☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource: .
☒ Wetlands: 0.15 acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

- ☐ Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource: .
☐ Wetlands: acres.

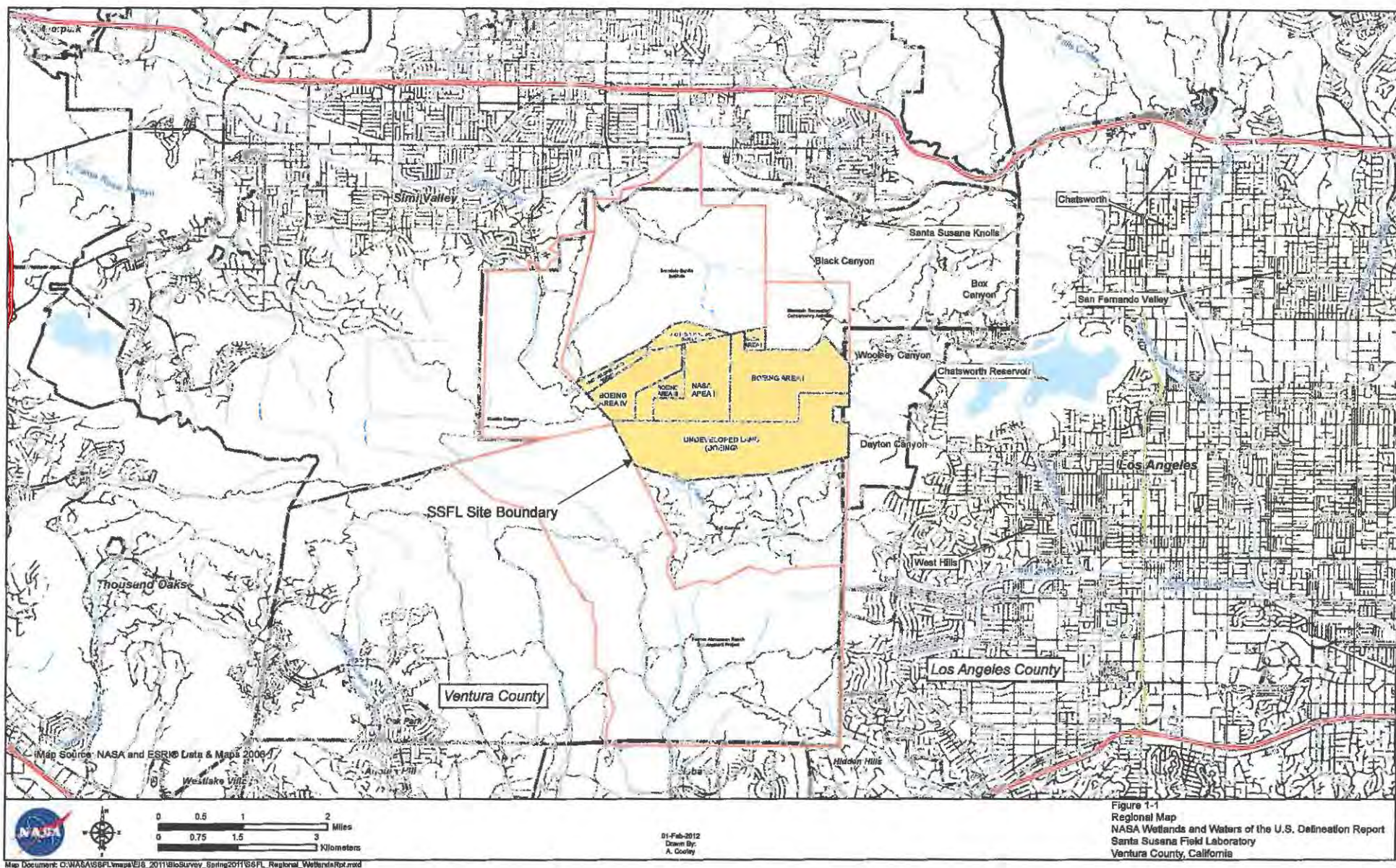
SECTION IV: DATA SOURCES.

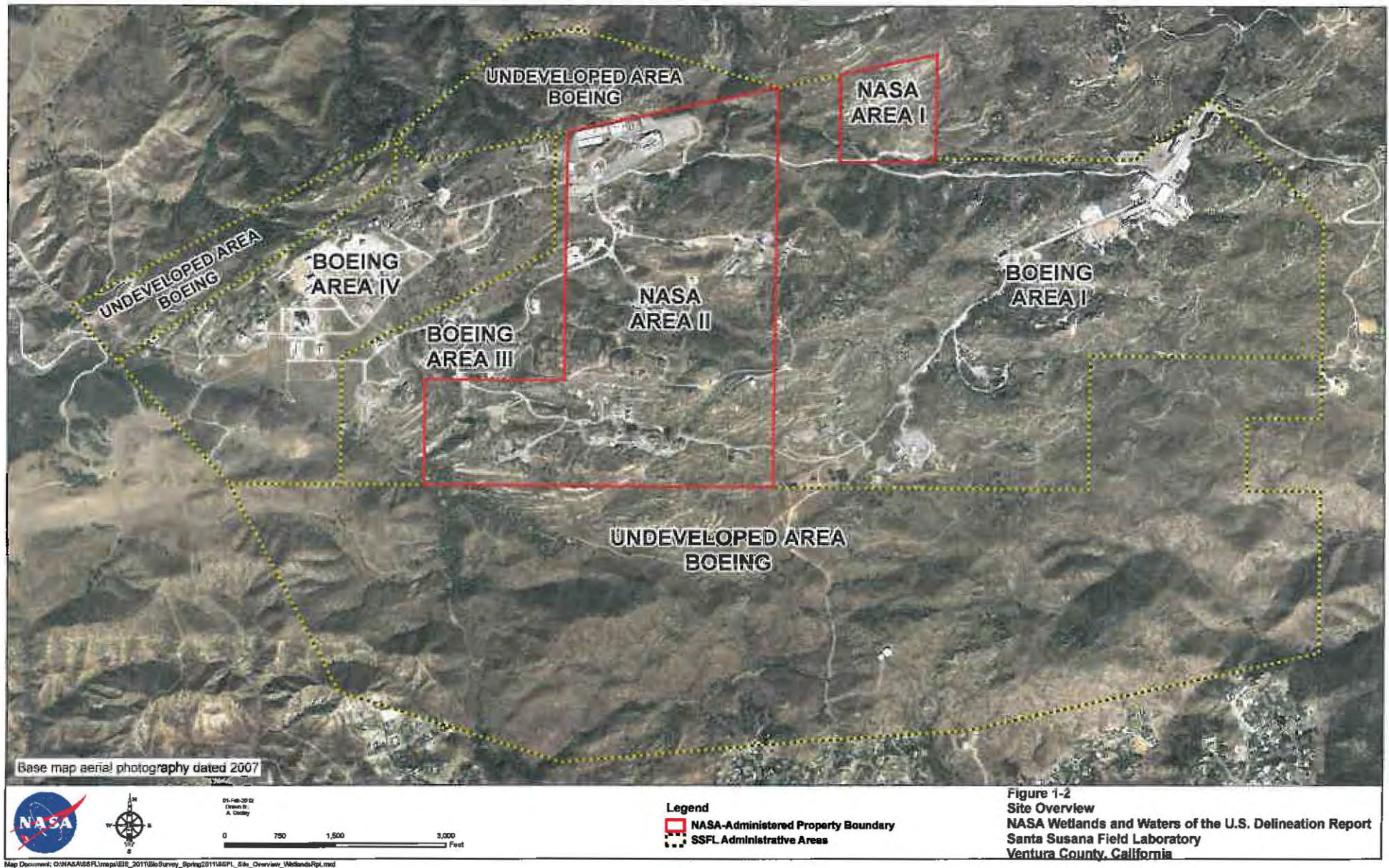
A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):

- ☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant:
☒ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
☒ Office concurs with data sheets/delineation report.
☐ Office does not concur with data sheets/delineation report.
☐ Data sheets prepared by the Corps:
☐ Corps navigable waters' study:
☐ U.S. Geological Survey Hydrologic Atlas:
☐ USGS NHD data.
☐ USGS 8 and 12 digit HUC maps.
☐ U.S. Geological Survey map(s). Cite scale & quad name:
☐ USDA Natural Resources Conservation Service Soil Survey. Citation:
☐ National wetlands inventory map(s). Cite name:
☐ State/Local wetland inventory map(s):
☐ FEMA/FIRM maps:
☐ 100-year Floodplain Elevation is: (National Geodetic Vertical Datum of 1929)
☒ Photographs: ☒ Aerial (Name & Date): google earth, various dates.
 or ☒ Other (Name & Date): site photos 12/20/2012.
☐ Previous determination(s). File no. and date of response letter:
☐ Applicable/supporting case law:
☐ Applicable/supporting scientific literature:
☐ Other information (please specify): .

B. ADDITIONAL COMMENTS TO SUPPORT JD: The subject pond appears to be an excavated feature approximately 0.15 acre in size that is seasonally ponded and supports wetland characteristics (classified as a seasonally flooded palustrine emergent wetland). There is no evidence indicating the pond overflows and connects with non-isolated drainage features which ultimately drain to a TNW or cross state lines. The pond is within the larger Calleguas Creek watershed and sits within an elevated plateau area surrounded by rock formations to the

north, east and south.. The drainage area of the pond is estimated to be approximately 20 acres. A small area of ponded water was evident within the larger feature during a 12/20/2012 site visit. No evidence of outflow (scour, debris deposits, etc) was observed. The nearest drainage feature, an ephemeral drainage channel ("northern drainage") ultimately draining to Calleguas Creek, is approximately 500 lateral feet and 100 vertical feet removed from the pond at its nearest point. No sources of interstate commerce were identified.







SW-2 pond drainage area (approx 20 acres)



SW-2 pond (12/20/2012)

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APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): 09/12/2012

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: CESPL-RG-N, Ventura Field Office; SSFL NASA Property Delineation; File no. SPL-2012-520-AJS: Northern Drainage

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: CA County/parish/borough: Ventura City: unincorporated (SSFL)
 Center coordinates of site (lat/long in degree decimal format): Lat. 32.23245° N, Long. 118.6982° W
 Universal Transverse Mercator:

Name of nearest waterbody: Northern Drainage

Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Lower Calleguas Creek

Name of watershed or Hydrologic Unit Code (HUC): Calleguas Creek (18070103)

☒ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.

☒ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc...) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☒ Office (Desk) Determination. Date: 09/12/2012

☒ Field Determination. Date(s): Jan 2012

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There ~~are~~ **are** "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [Required]

☒ Waters subject to the ebb and flow of the tide.

☒ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.
 Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There ~~are and are not~~ "waters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [Required]

1. Waters of the U.S.

a. Indicate presence of waters of U.S. in review area (check all that apply):¹

- ☐ TNWs, including territorial seas
- ☐ Wetlands adjacent to TNWs
- ☒ Relatively permanent waters² (RPWs) that flow directly or indirectly into TNWs
- ☒ Non-RPWs that flow directly or indirectly into TNWs
- ☐ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
- ☐ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
- ☐ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
- ☐ Impoundments of jurisdictional waters
- ☒ Isolated (interstate or intrastate) waters, including isolated wetlands

b. Identify (estimate) size of waters of the U.S. in the review area:

Non-wetland waters: 3200 linear feet: 8width (ft) and/or acres.

Wetlands: acres.

c. Limits (boundaries) of jurisdiction based on: Established by OHWM.

Elevation of established OHWM (if known):

2. Non-regulated waters/wetlands (check if applicable):³

¹ Boxes checked below shall be supported by completing the appropriate sections in Section III below.

² For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).

³ Supporting documentation is presented in Section III.F.

- ☒ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain: **a small pond, approximately 0.15 acre in size and apparently excavated within the drainage area, was determined to be isolated. A separate JD form was prepared to address this pond.**

SECTION III: CWA ANALYSIS**A. TNWs AND WETLANDS ADJACENT TO TNWs**

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW

Identify TNW:

Summarize rationale supporting determination:

2. Wetland adjacent to TNW

Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody⁴ is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below:

1. Characteristics of non-TNWs that flow directly or indirectly into TNW**(i) General Area Conditions:**

Watershed size: 291 square miles
 Drainage area: 400 acres
 Average annual rainfall: 19 inches
 Average annual snowfall: 0 inches

(ii) Physical Characteristics:**(a) Relationship with TNW:**

- ☐ Tributary flows directly into TNW.
☒ Tributary flows through 5 tributaries before entering TNW.

Project waters are 15-20 river miles from TNW.
 Project waters are 1-3 river miles from RPW.
 Project waters are 20-25 aerial (straight) miles from TNW.
 Project waters are 2-5 aerial (straight) miles from RPW.
 Project waters cross or serve as state boundaries. Explain: n/a.

Identify flow route to TNW⁵: Northern Drainage flows approximately 2.5 miles to Meier Creek, thence to Arroyo Simi, Arroyo Las Posas and Calleguas Creek. The downstream TNW is the upper limit of tidal influence on Calleguas Creek.

⁴ Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

⁵ Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

Tributary stream order, if known:

(b) General Tributary Characteristics (check all that apply):

Tributary is: ☐ Natural
☐ Artificial (man-made). Explain:
☒ Manipulated (man-altered). Explain: culverted road xings.

Tributary properties with respect to top of bank (estimate):

Average width: 8 feet
 Average depth: 2 feet
 Average side slopes: 2:1.

Primary tributary substrate composition (check all that apply):

☒ Silts ☒ Sands ☐ Concrete
☐ Cobbles ☐ Gravel ☐ Muck
☒ Bedrock ☐ Vegetation. Type/% cover:
☐ Other. Explain:

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: some incision evident.

Presence of run/riffle/pool complexes. Explain: n/a.

Tributary geometry: Meandering

Tributary gradient (approximate average slope): 1 %

(c) Flow:

Tributary provides for: Seasonal flow

Estimate average number of flow events in review area/year: 2-5

Describe flow regime: intermittent.

Other information on duration and volume:

Surface flow is: Confined. Characteristics:

Subsurface flow: Unknown. Explain findings:

☐ Dye (or other) test performed:

Tributary has (check all that apply):

☒ Bed and banks
☒ OHWM⁶ (check all indicators that apply):
☐ clear, natural line impressed on the bank ☒ the presence of litter and debris
☐ changes in the character of soil ☐ destruction of terrestrial vegetation
☒ shelving ☐ the presence of wrack line
☐ vegetation matted down, bent, or absent ☐ sediment sorting
☐ leaf litter disturbed or washed away ☐ scour
☐ sediment deposition ☐ multiple observed or predicted flow events
☐ water staining ☐ abrupt change in plant community
☐ other (list):
☐ Discontinuous OHWM.⁷ Explain:

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):

☒ High Tide Line indicated by: ☐ Mean High Water Mark indicated by:
☐ oil or scum line along shore objects ☐ survey to available datum;
☐ fine shell or debris deposits (foreshore) ☐ physical markings;
☐ physical markings/characteristics ☐ vegetation lines/changes in vegetation types.
☐ tidal gauges
☐ other (list):

(iii) Chemical Characteristics:

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).

Explain: water not present at time of delineation.

Identify specific pollutants, if known: heavy metals, dioxin.

⁶A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.

⁷Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

- ☐ Riparian corridor. Characteristics (type, average width):
- ☐ Wetland fringe. Characteristics:
- ☐ Habitat for:
- ☐ Federally Listed species. Explain findings:
- ☐ Fish/spawn areas. Explain findings:
- ☐ Other environmentally-sensitive species. Explain findings:
- ☐ Aquatic/wildlife diversity. Explain findings:

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW**(i) Physical Characteristics:****(a) General Wetland Characteristics:**

Properties:

Wetland size: acres

Wetland type. Explain:

Wetland quality. Explain:

Project wetlands cross or serve as state boundaries. Explain:

(b) General Flow Relationship with Non-TNW:Flow is: Pick List. Explain:Surface flow is: Pick List:

Characteristics:

Subsurface flow: Pick List. Explain findings:☐ Dye (or other) test performed:**(c) Wetland Adjacency Determination with Non-TNW:**

- ☐ Directly abutting
- ☐ Not directly abutting
- ☐ Discrete wetland hydrologic connection. Explain:
- ☐ Ecological connection. Explain:
- ☐ Separated by berm/barrier. Explain:

(d) Proximity (Relationship) to TNWProject wetlands are Pick List river miles from TNW.Project waters are Pick List aerial (straight) miles from TNW.Flow is from: Pick List.Estimate approximate location of wetland as within the Pick List floodplain.**(ii) Chemical Characteristics:**

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain:

Identify specific pollutants, if known:

(iii) Biological Characteristics. Wetland supports (check all that apply):

- ☐ Riparian buffer. Characteristics (type, average width):
- ☐ Vegetation type/percent cover. Explain:
- ☐ Habitat for:
- ☐ Federally Listed species. Explain findings:
- ☐ Fish/spawn areas. Explain findings:
- ☐ Other environmentally-sensitive species. Explain findings:
- ☐ Aquatic/wildlife diversity. Explain findings:

3. Characteristics of all wetlands adjacent to the tributary (if any)All wetland(s) being considered in the cumulative analysis: Pick List

Approximately () acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

<u>Directly abuts? (Y/N)</u>	<u>Size (in acres)</u>	<u>Directly abuts? (Y/N)</u>	<u>Size (in acres)</u>
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Summarize overall biological, chemical and physical functions being performed:

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D: The subject tributary is an ephemeral drainage with an ordinary high water mark of 6-10 feet in width. Estimated discharge volumes at Outfall 009 (which includes the subject tributary plus the contribution from the ELV tributary) is approximately 12 cfs for a 1-year, 24-hour flood event, 49 cfs for the 10-year event and 100 cfs for the 100-year event. The downstream TNW (upper limit of tidal influence on Calleguas Creek) is approximately 28 miles downstream. The total drainage area of the tributary represents approximately 0.21% of the watershed draining to the downstream TNW. Soil testing within the channel and surrounding watershed have revealed elevated levels of heavy metals (lead, cadmium, copper and/or mercury) as well as dioxin at one location. The tributary therefore has a significant nexus to the downstream TNW by virtue of its potential to deliver contaminants downstream.
2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:
3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
☐ TNWs: linear feet width (ft), Or, acres.
☐ Wetlands adjacent to TNWs: acres.
2. **RPWs that flow directly or indirectly into TNWs.**

- ☐ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial:
- ☐ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:

Provide estimates for jurisdictional waters in the review area (check all that apply):

- ☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
 Identify type(s) of waters: .

3. Non-RPWs⁸ that flow directly or indirectly into TNWs.

- ☐ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

- ☒ Tributary waters: **3,000** linear feet; **8** width (ft).
☐ Other non-wetland waters: acres.
 Identify type(s) of waters: .

4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.

- ☐ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
- ☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .
- ☐ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.

- ☐ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.

- ☐ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres.

7. Impoundments of jurisdictional waters.⁹

As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.

- ☐ Demonstrate that impoundment was created from "waters of the U.S.," or
☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):¹⁰

⁸See Footnote # 3.

⁹To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

¹⁰Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA Memorandum Regarding CWA Act Jurisdiction Following Rapanos.

- ☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.
- ☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
- ☐ which are or could be used for industrial purposes by industries in interstate commerce.
- ☐ Interstate isolated waters. Explain: .
- ☐ Other factors. Explain: .

Identify water body and summarize rationale supporting determination:

Provide estimates for jurisdictional waters in the review area (check all that apply):

- ☐ Tributary waters: linear feet width (ft).
- ☐ Other non-wetland waters: acres.
- Identify type(s) of waters: .
- ☐ Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

- ☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
- ☒ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
 - ☒ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
- ☐ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain: .
- ☐ Other: (explain, if not covered above): .

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

- ☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
- ☐ Lakes/ponds: 0.15 acres.
- ☐ Other non-wetland waters: acres. List type of aquatic resource: .
- ☐ Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

- ☐ Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
- ☐ Lakes/ponds: acres.
- ☐ Other non-wetland waters: acres. List type of aquatic resource: .
- ☐ Wetlands: acres.

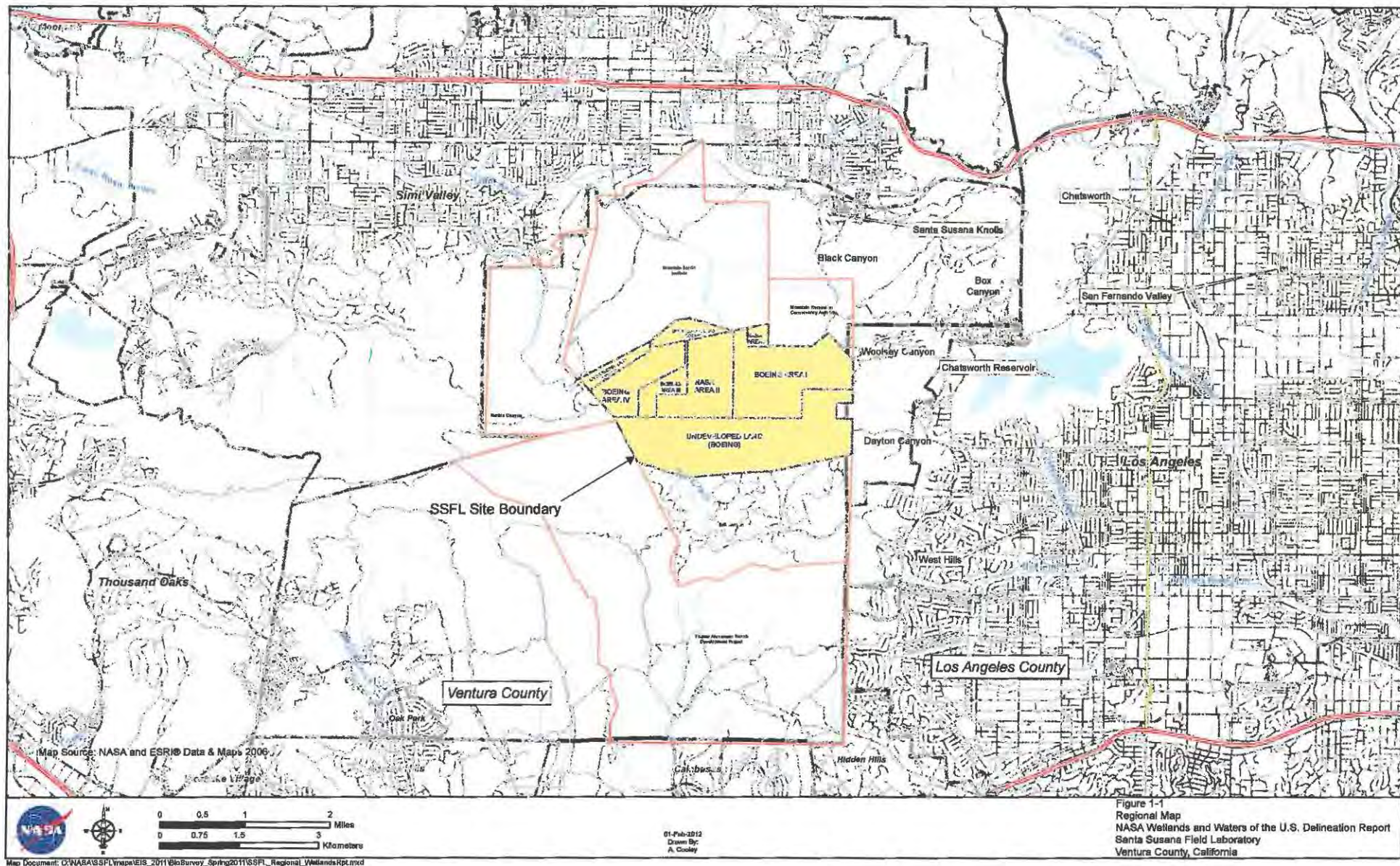
SECTION IV: DATA SOURCES.

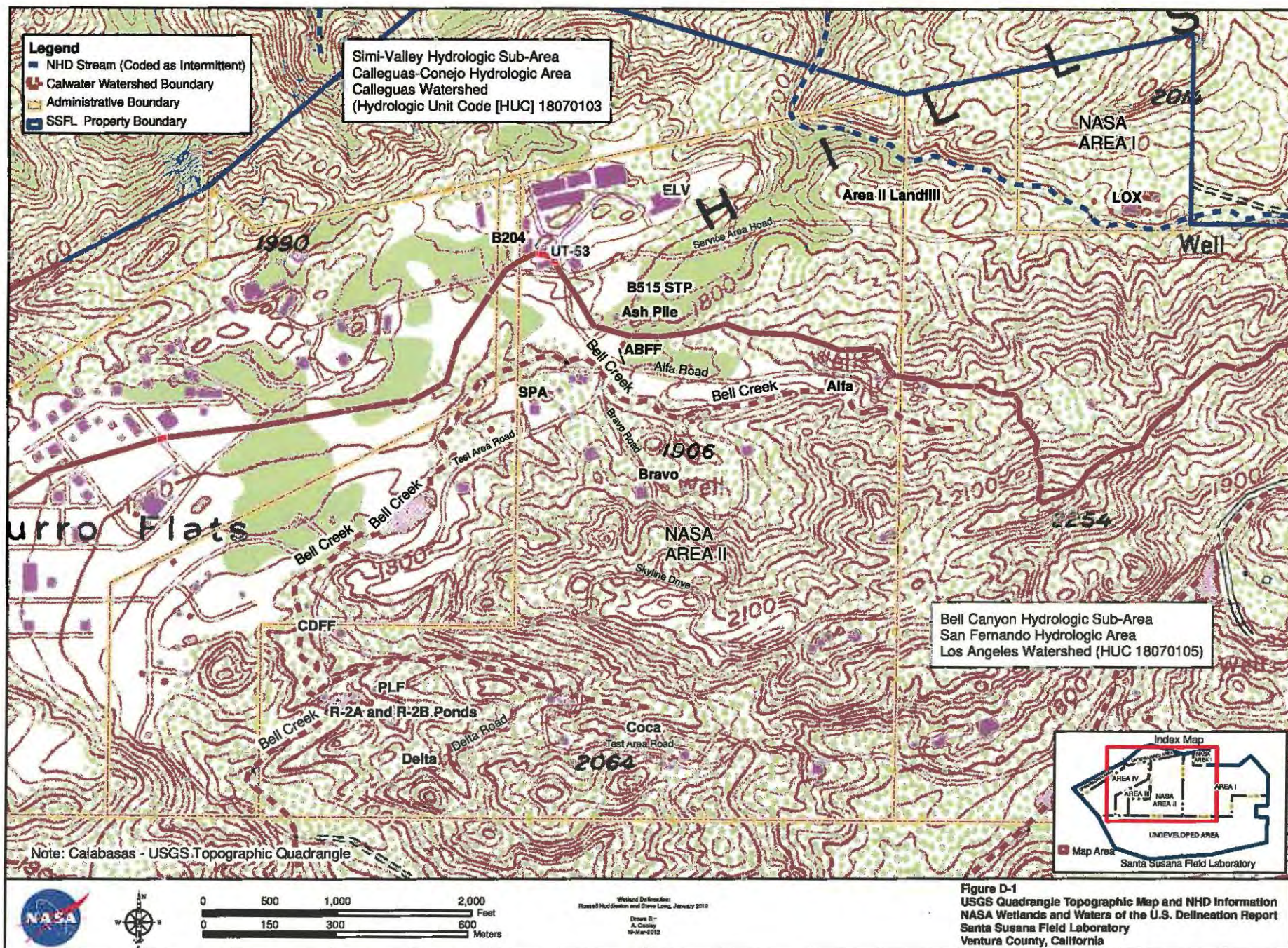
A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):

- ☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant:
- ☒ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
 - ☒ Office concurs with data sheets/delineation report.
 - ☐ Office does not concur with data sheets/delineation report.
- ☐ Data sheets prepared by the Corps:
- ☐ Corps navigable waters' study:
- ☐ U.S. Geological Survey Hydrologic Atlas:
 - ☐ USGS NHD data.
 - ☐ USGS 8 and 12 digit HUC maps.
- ☐ U.S. Geological Survey map(s). Cite scale & quad name:
- ☐ USDA Natural Resources Conservation Service Soil Survey. Citation:
- ☐ National wetlands inventory map(s). Cite name:
- ☐ State/Local wetland inventory map(s): .
- ☐ FEMA/FIRM maps:
- ☐ 100-year Floodplain Elevation is: (National Geodetic Vertical Datum of 1929)
- ☐ Photographs: ☐ Aerial (Name & Date): .
 - or ☐ Other (Name & Date): .
- ☒ Previous determination(s). File no. and date of response letter: file no SPL-2009-412-AJS (4/27/2010).

- ☐ Applicable/supporting case law:
- ☐ Applicable/supporting scientific literature:
- ☐ Other information (please specify):

B. ADDITIONAL COMMENTS TO SUPPORT JD: The subject tributary is a small 2nd order drainage channel with an average OHWM width of 6 feet. The drainage area, including the two 1st order streams that feed into tributary 2 (tribs 3 & 4) is roughly 400 acres. Flows from the tributary pass through the Outfall 009 water quality sampling station installed by the applicant. Data from the sampling station (2004-2007) showed exceedences of permit limits of copper on one occasion, lead on 2 occasions and a dioxin congener on three occasions. Soil sampling within the drainage area has identified elevated levels of heavy metals and dioxin. Based on these results, the subject tributary appears to have a significant nexus to the downstream TNW (upper limit of tidal influence on Calleguas Creek) based on the potential to deliver contaminants downstream.







APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): 01/15/2013

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: CESPL-RG-N, Ventura Field Office; SSFL NASA Property Delineation;
File no. SPL-2012-520-AJS: COCA Drainage

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: CA County/parish/borough: Ventura City: unincorporated (SSFL)
 Center coordinates of site (lat/long in degree decimal format): Lat. 32.23245° N, Long. 118.6982° W
 Universal Transverse Mercator:

Name of nearest waterbody: COCA drainage

Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Los Angeles River

Name of watershed or Hydrologic Unit Code (HUC): Los Angeles River (18070105)

☒ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.

☒ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc...) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☒ Office (Desk) Determination. Date: 09/12/2012

☒ Field Determination. Date(s): Jan 2012

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There ☒ are "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [Required]

☒ Waters subject to the ebb and flow of the tide.

☒ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.
 Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There ☒ are "waters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [Required]

1. Waters of the U.S.

a. Indicate presence of waters of U.S. in review area (check all that apply):¹

- ☒ TNWs, including territorial seas
- ☒ Wetlands adjacent to TNWs
- ☒ Relatively permanent waters² (RPWs) that flow directly or indirectly into TNWs
- ☒ Non-RPWs that flow directly or indirectly into TNWs
- ☒ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
- ☒ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
- ☒ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
- ☒ Impoundments of jurisdictional waters
- ☒ Isolated (interstate or intrastate) waters, including isolated wetlands

b. Identify (estimate) size of waters of the U.S. in the review area:

Non-wetland waters: 2,000 linear feet: 5 width (ft) and/or 0.42 acres.

Wetlands: 0.33 acres.

c. Limits (boundaries) of jurisdiction based on: Established by OHWSM

Elevation of established OHWM (if known):

2. Non-regulated waters/wetlands (check if applicable):³

☒ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional.
 Explain:

¹ Boxes checked below shall be supported by completing the appropriate sections in Section III below.

² For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).

³ Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS**A. TNWs AND WETLANDS ADJACENT TO TNWs**

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW

Identify TNW: .

Summarize rationale supporting determination:

2. Wetland adjacent to TNW

Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody⁴ is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW**(i) General Area Conditions:**

Watershed size: 375 square miles

Drainage area: 45 square miles

Average annual rainfall: 19 inches

Average annual snowfall: 0 inches

(ii) Physical Characteristics:**(a) Relationship with TNW:**

☐ Tributary flows directly into TNW.

☒ Tributary flows through 3 tributaries before entering TNW.

Project waters are 5-10 river miles from TNW.

Project waters are 1 (or less) river miles from RPW.

Project waters are 5-10 aerial (straight) miles from TNW.

Project waters are 1 (or less) aerial (straight) miles from RPW.

Project waters cross or serve as state boundaries. Explain: n/a.

⁴ Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

Identify flow route to TNW⁵: Upper Southwestern Drainage flows into R2A Pond, thence to Bell Canyon Channel (natural), thence to the channelized section of lower Bell Canyon. The downstream TNW is upper end of the Los Angeles River, at the confluence of Bell Canyon Channel and Arroyo Calabasas.
Tributary stream order, if known: 1.

(b) General Tributary Characteristics (check all that apply):

Tributary is: ☐ Natural
☐ Artificial (man-made). Explain:
☒ Manipulated (man-altered). Explain: culvert, shotcrete swales, water control weirs and impoundments present.

Tributary properties with respect to top of bank (estimate):

Average width: 4-5 feet
Average depth: 1 foot
Average side slopes: 2:1

Primary tributary substrate composition (check all that apply):

☒ Silts ☒ Sands ☒ Concrete
☐ Cobbles ☐ Gravel ☐ Muck
☒ Bedrock ☐ Vegetation. Type/% cover:
☐ Other. Explain:

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: some incision evident.

Presence of run/riffle/pool complexes. Explain: n/a.

Tributary geometry: Relatively straight

Tributary gradient (approximate average slope): 1 %

(c) Flow:

Tributary provides for: ephemeral flow

Estimate average number of flow events in review area/year: 4-5

Describe flow regime: ephemeral.

Other information on duration and volume: Channel previously affected by discharges from SSFL test operations requiring cooling water (no longer conducted). Channel and downstream impoundments acted to collect cooling water discharges during rocket engine testing.

Surface flow is: Discrete and confined. Characteristics:

Subsurface flow: Unknown. Explain findings:

☐ Dye (or other) test performed:

Tributary has (check all that apply):

☒ Bed and banks
☒ OHWM⁶ (check all indicators that apply):
☐ clear, natural line impressed on the bank ☐ the presence of litter and debris
☐ changes in the character of soil ☐ destruction of terrestrial vegetation
☒ shelving ☐ the presence of wrack line
☐ vegetation matted down, bent, or absent ☐ sediment sorting
☐ leaf litter disturbed or washed away ☐ scour
☐ sediment deposition ☐ multiple observed or predicted flow events
☒ water staining ☐ abrupt change in plant community
☐ other (list):
☐ Discontinuous OHWM.⁷ Explain:

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):

☒ High Tide Line indicated by: ☐ Mean High Water Mark indicated by:
☐ oil or scum line along shore objects ☐ survey to available datum;
☐ fine shell or debris deposits (foreshore) ☐ physical markings;
☐ physical markings/characteristics ☐ vegetation lines/changes in vegetation types.
☐ tidal gauges
☐ other (list):

⁵ Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

⁶ A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.

⁷ Ibid.

(iii) Chemical Characteristics:

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).

Explain: water not present at time of delineation.

Identify specific pollutants, if known: heavy metals.

(iv) Biological Characteristics. Channel supports (check all that apply):

- ☐ Riparian corridor. Characteristics (type, average width):
- ☐ Wetland fringe. Characteristics:
- ☐ Habitat for:
- ☐ Federally Listed species. Explain findings:
- ☐ Fish/spawn areas. Explain findings:
- ☐ Other environmentally-sensitive species. Explain findings:
- ☐ Aquatic/wildlife diversity. Explain findings:

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW**(i) Physical Characteristics:****(a) General Wetland Characteristics:****Properties:**

Wetland size: 0.33 acres

Wetland type. Explain: palustrine.

Wetland quality. Explain: poor, formed as a result of impoundments intened to collect runoff from testing operations (no longer conducted).

Project wetlands cross or serve as state boundaries. Explain: n/a.

(b) General Flow Relationship with Non-TNW:Flow is: ephemeral flow Explain:Surface flow is: Not present

Characteristics:

Subsurface flow: Unknown Explain findings:☐ Dye (or other) test performed:**(c) Wetland Adjacency Determination with Non-TNW:**☒ Directly abutting☐ Not directly abutting☐ Discrete wetland hydrologic connection. Explain:☐ Ecological connection. Explain:☐ Separated by berm/barrier. Explain:**(d) Proximity (Relationship) to TNW**Project wetlands are 3-10 river miles from TNW.Project waters are 3-10 aerial (straight) miles from TNW.Flow is from: Wetland to navigable waterway.Estimate approximate location of wetland as within the 2-year or less floodplain.**(ii) Chemical Characteristics:**

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: dry at time of delineation.

Identify specific pollutants, if known: heavy metals detected downstream.

(iii) Biological Characteristics. Wetland supports (check all that apply):

- ☐ Riparian buffer. Characteristics (type, average width):
- ☐ Vegetation type/percent cover. Explain:
- ☐ Habitat for:
- ☐ Federally Listed species. Explain findings:
- ☐ Fish/spawn areas. Explain findings:
- ☐ Other environmentally-sensitive species. Explain findings:
- ☐ Aquatic/wildlife diversity. Explain findings:

3. Characteristics of all wetlands adjacent to the tributary (if any)All wetland(s) being considered in the cumulative analysis: 1

Approximately (0.33) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

<u>Directly abuts? (Y/N)</u>	<u>Size (in acres)</u>	<u>Directly abuts? (Y/N)</u>	<u>Size (in acres)</u>
y	0.33		

Summarize overall biological, chemical and physical functions being performed: very small impoundment area with managed hydrology. Dominated by *Typha* sp. and unvegetated open water (dry at time of delineation). An additional impoundment along flow route likely supports palustrine fringe wetlands, however this was outside the assessment area.

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:
2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: The subject tributary is a small ephemeral drainage with a discontinuous ordinary high water mark averaging 4-5 feet in width. The tributary includes concrete-lined sections and flow control weirs. Historically, the channel functioned to collect and convey runoff from adjacent rocket engine test stands that require substantial amounts of cooling water during testing. Flows are eventually conveyed to a holding pond off the NASA property (Boeing property) and thence to a secondary pond ("R2A Pond") and thence to Bell Canyon Channel. The downstream TNW (upper reach of the Los Angeles River) is approximately 8 miles downstream. The total drainage area of the tributary represents approximately 2% of the watershed draining to the downstream TNW. Soil testing within the channel and surrounding watershed have revealed elevated levels of heavy metals (lead, cadmium, copper and/or mercury). The tributary therefore has a significant nexus to the downstream TNW by virtue of its potential to deliver contaminants downstream.
3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: Wetlands present are palustrine in nature as the result of impoundments of tributary. Flow and potential pollutants would be conveyed through wetland, therefore the wetlands in question have a significant nexus to the downstream TNW.

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
☒ TNWs: linear feet width (ft), Or, acres.

☐ Wetlands adjacent to TNWs: acres.

2. RPWs that flow directly or indirectly into TNWs.

- ☐ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial:
- ☐ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:

Provide estimates for jurisdictional waters in the review area (check all that apply):

- ☐ Tributary waters: linear feet width (ft).
- ☐ Other non-wetland waters: acres.
- Identify type(s) of waters: .

3. Non-RPWs⁸ that flow directly or indirectly into TNWs.

- ☐ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

- ☒ Tributary waters: **3700** linear feet; **5** width (ft).
- ☐ Other non-wetland waters: acres.
- Identify type(s) of waters: .

4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.

- ☐ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
- ☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .
- ☐ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.

- ☐ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.

- ☒ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: **0.13** acres.

7. Impoundments of jurisdictional waters.⁹

As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.

- ☐ Demonstrate that impoundment was created from "waters of the U.S.," or
- ☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
- ☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

⁸See Footnote # 3.

⁹To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):¹⁰

- ☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.
☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
☐ which are or could be used for industrial purposes by industries in interstate commerce.
☐ Interstate isolated waters. Explain: _____
☐ Other factors. Explain: _____

Identify water body and summarize rationale supporting determination:

Provide estimates for jurisdictional waters in the review area (check all that apply):

- ☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
 Identify type(s) of waters: _____
☐ Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

- ☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
☐ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
☐ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
☐ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain: _____
☐ Other: (explain, if not covered above): _____

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

- ☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
☐ Lakes/ponds: 0.155 acres.
☐ Other non-wetland waters: acres. List type of aquatic resource: _____
☐ Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

- ☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource: _____
☐ Wetlands: acres.

SECTION IV: DATA SOURCES.

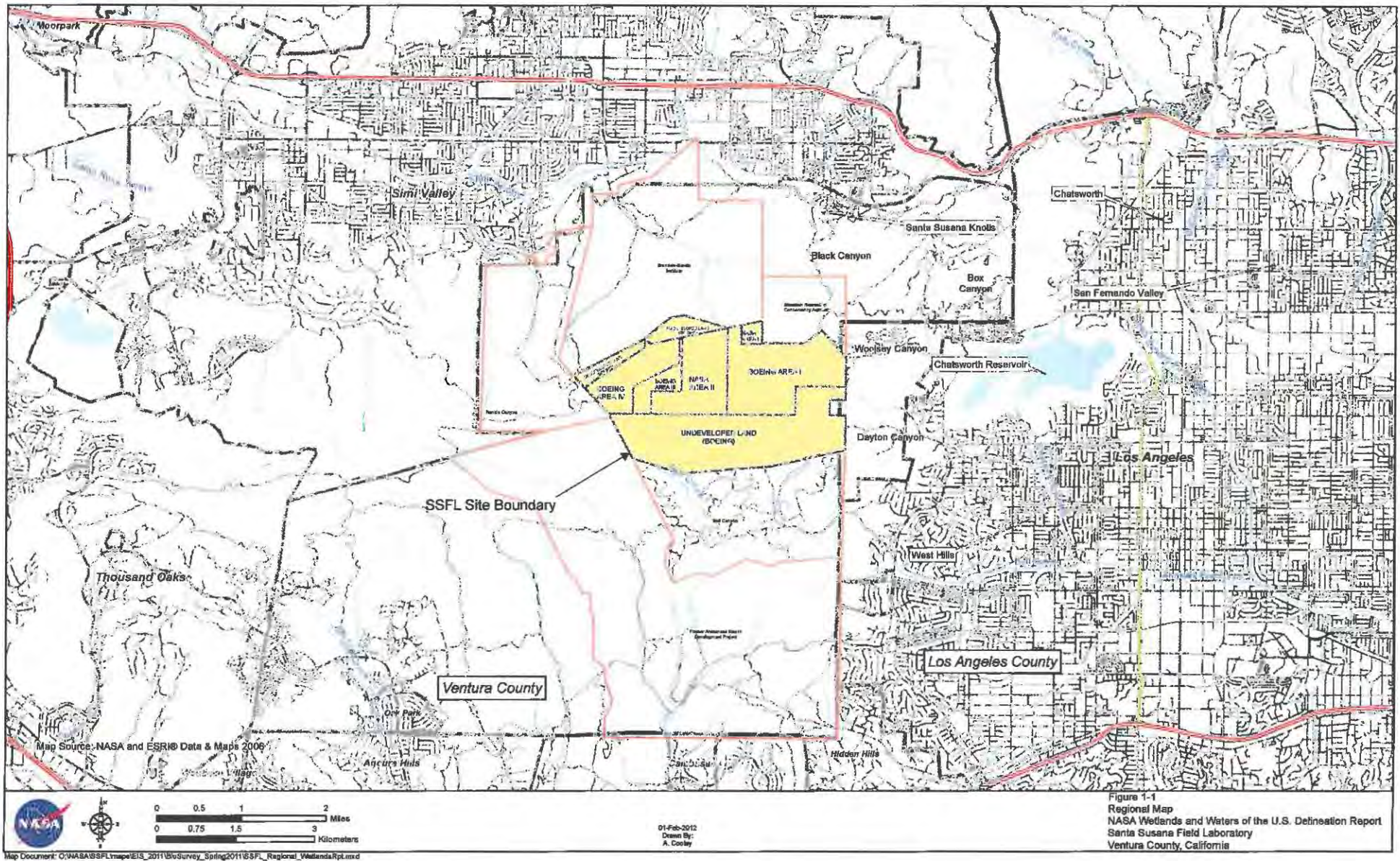
A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):

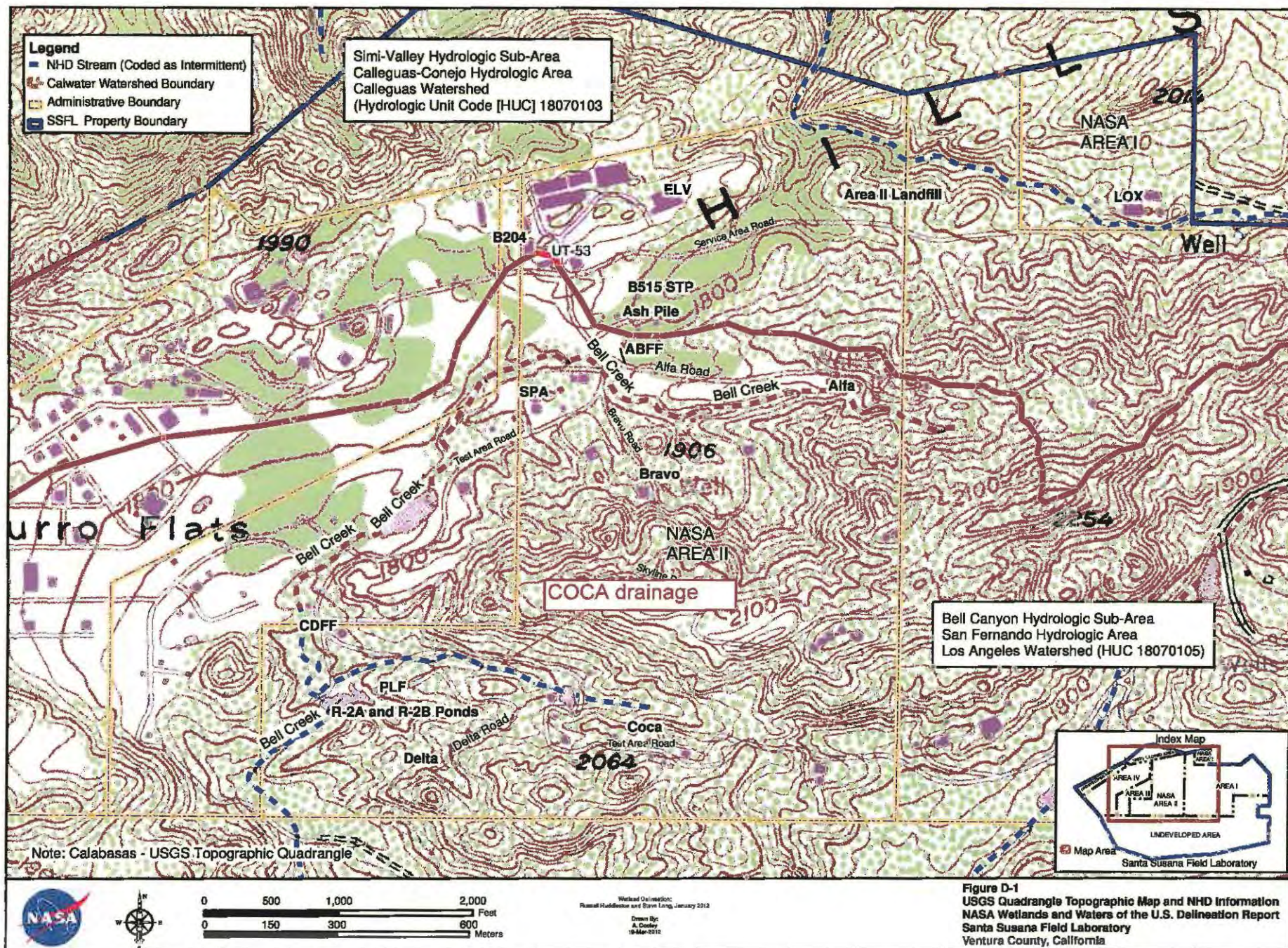
- ☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant:
☒ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
☒ Office concurs with data sheets/delineation report.
☐ Office does not concur with data sheets/delineation report.
☐ Data sheets prepared by the Corps:
☐ Corps navigable waters' study:
☐ U.S. Geological Survey Hydrologic Atlas:
☐ USGS NHD data.
☐ USGS 8 and 12 digit HUC maps.
☐ U.S. Geological Survey map(s). Cite scale & quad name:
☐ USDA Natural Resources Conservation Service Soil Survey. Citation:
☐ National wetlands inventory map(s). Cite name:
☐ State/Local wetland inventory map(s):

¹⁰ Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA Memorandum Regarding CWA Act Jurisdiction Following Rapanos.

- ☐ FEMA/FIRM maps:
- ☐ 100-year Floodplain Elevation is: (National Geodetic Vertical Datum of 1929)
- ☐ Photographs: ☐ Aerial (Name & Date):
or ☐ Other (Name & Date):
- ☐ Previous determination(s). File no. and date of response letter: .
- ☐ Applicable/supporting case law:
- ☐ Applicable/supporting scientific literature:
- ☐ Other information (please specify): .

B. ADDITIONAL COMMENTS TO SUPPORT JD: The subject tributary is a small first order drainage channel with an average OHWM width of 4-5 feet. The drainage area is roughly 495 acres. Soil sampling within the drainage area has identified elevated levels of heavy metals and dioxin. Based on these results, the subject tributary appears to have a significant nexus to the downstream TNW (upper Los Angeles River, approximately 8 river miles downstream) based on the potential to deliver contaminants downstream.







APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): 09/12/2012

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: CESPL-RG-N, Ventura Field Office; SSFL NASA Property Delineation; File no. SPL-2012-520-AJS: ELV Drainage

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: CA County/parish/borough: Ventura City: unincorporated (SSFL)
 Center coordinates of site (lat/long in degree decimal format): Lat. 32.23245° N, Long. 118.6982° W
 Universal Transverse Mercator:

Name of nearest waterbody: ELV Drainage

Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Lower Calleguas Creek

Name of watershed or Hydrologic Unit Code (HUC): Calleguas Creek (18070103)

☒ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.

☒ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc...) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☒ Office (Desk) Determination. Date: 09/12/2012

☒ Field Determination. Date(s): Jan 2012

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There ☒ **are** "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [Required]

☒ Waters subject to the ebb and flow of the tide.

☒ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.
 Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There ☒ **are** "waters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [Required]

1. Waters of the U.S.

a. Indicate presence of waters of U.S. in review area (check all that apply):¹

- ☒ TNWs, including territorial seas
- ☒ Wetlands adjacent to TNWs
- ☒ Relatively permanent waters² (RPWs) that flow directly or indirectly into TNWs
- ☒ Non-RPWs that flow directly or indirectly into TNWs
- ☒ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
- ☒ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
- ☒ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
- ☒ Impoundments of jurisdictional waters
- ☒ Isolated (interstate or intrastate) waters, including isolated wetlands

b. Identify (estimate) size of waters of the U.S. in the review area:

Non-wetland waters: 1250 linear feet: 5 width (ft) and/or 0.171 acres.

Wetlands: 0 acres.

c. Limits (boundaries) of jurisdiction based on: Established by THWSE

Elevation of established OHWM (if known):

2. Non-regulated waters/wetlands (check if applicable):³

☒ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional.
 Explain:

¹ Boxes checked below shall be supported by completing the appropriate sections in Section III below.

² For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).

³ Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS**A. TNWs AND WETLANDS ADJACENT TO TNWs**

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW

Identify TNW:

Summarize rationale supporting determination:

2. Wetland adjacent to TNW

Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody⁴ is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW**(i) General Area Conditions:**

Watershed size: 291 square miles

Drainage area: 67 acres

Average annual rainfall: 19 inches

Average annual snowfall: 0 inches

(ii) Physical Characteristics:**(a) Relationship with TNW:**

☐ Tributary flows directly into TNW.

☒ Tributary flows through 2 tributaries before entering TNW.

Project waters are 15-20 river miles from TNW.

Project waters are 2-5 river miles from RPW.

Project waters are 20-25 aerial (straight) miles from TNW.

Project waters are 1-5 aerial (straight) miles from RPW.

Project waters cross or serve as state boundaries. Explain: n/a.

Identify flow route to TNW⁵: ELV Drainage flows approximately 2.5 miles to Meier Creek, thence to Arroyo Simi, Arroyo Las Posas and Calleguas Creek. The downstream TNW is the upper limit of tidal influence on Calleguas Creek.

⁴ Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

⁵ Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

Tributary stream order, if known: 1.

(b) General Tributary Characteristics (check all that apply):

Tributary is: ☐ Natural
☐ Artificial (man-made). Explain:
☒ Manipulated (man-altered). Explain: culverted road xing, and approx 100-foot section has been lined with asphalt.

Tributary properties with respect to top of bank (estimate):

Average width: 5 feet
 Average depth: 1 foot
 Average side slopes: 2:1

Primary tributary substrate composition (check all that apply):

☒ Silts ☒ Sands ☐ Concrete
☐ Cobbles ☐ Gravel ☐ Muck
☐ Bedrock ☐ Vegetation. Type/% cover:
☐ Other. Explain:

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: some incision evident.

Presence of run/riffle/pool complexes. Explain: n/a.

Tributary geometry: andering

Tributary gradient (approximate average slope): 1 %

(c) Flow:

Tributary provides for: Seasonal flow

Estimate average number of flow events in review area/year: 2-5

Describe flow regime: intermittent.

Other information on duration and volume:

Surface flow is: continuous. Characteristics:

Subsurface flow: Unknown. Explain findings:

☐ Dye (or other) test performed:

Tributary has (check all that apply):

☒ Bed and banks
☒ OHWM⁶ (check all indicators that apply):
☐ clear, natural line impressed on the bank ☒ the presence of litter and debris
☐ changes in the character of soil ☐ destruction of terrestrial vegetation
☒ shelving ☐ the presence of wrack line
☐ vegetation matted down, bent, or absent ☐ sediment sorting
☐ leaf litter disturbed or washed away ☐ scour
☐ sediment deposition ☐ multiple observed or predicted flow events
☐ water staining ☐ abrupt change in plant community
☐ other (list):
☐ Discontinuous OHWM.⁷ Explain:

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):

☒ High Tide Line indicated by: ☐ Mean High Water Mark indicated by:
☐ oil or scum line along shore objects ☐ survey to available datum;
☐ fine shell or debris deposits (foreshore) ☐ physical markings;
☐ physical markings/characteristics ☐ vegetation lines/changes in vegetation types.
☐ tidal gauges
☐ other (list):

(iii) Chemical Characteristics:

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).

Explain: water not present at time of delineation.

Identify specific pollutants, if known: heavy metals, dioxin recorded at monitoring station (Outfall 009) which includes the subwatershed of this drainage feature. No monitoring results of this specific drainage channel are available, however the drainage area

⁶A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.

⁷Ibid.

includes facilities historically operated as part of the Santa Susanna Field Lab and it likely similar contaminants would be generated within this drainage area.

(iv) Biological Characteristics. Channel supports (check all that apply):

- ☐ Riparian corridor. Characteristics (type, average width):
- ☐ Wetland fringe. Characteristics:
- ☐ Habitat for:
- ☐ Federally Listed species. Explain findings:
- ☐ Fish/spawn areas. Explain findings:
- ☐ Other environmentally-sensitive species. Explain findings:
- ☐ Aquatic/wildlife diversity. Explain findings:

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW**(i) Physical Characteristics:****(a) General Wetland Characteristics:****Properties:**

Wetland size: acres

Wetland type. Explain:

Wetland quality. Explain:

Project wetlands cross or serve as state boundaries. Explain:

(b) General Flow Relationship with Non-TNW:Flow is: Perennial. Explain:Surface flow is: Perennial

Characteristics:

Subsurface flow: Perennial. Explain findings:☐ Dye (or other) test performed:**(c) Wetland Adjacency Determination with Non-TNW:**

- ☐ Directly abutting
- ☐ Not directly abutting
- ☐ Discrete wetland hydrologic connection. Explain:
- ☐ Ecological connection. Explain:
- ☐ Separated by berm/barrier. Explain:

(d) Proximity (Relationship) to TNWProject wetlands are 0.5 river miles from TNW.Project waters are 0.5 aerial (straight) miles from TNW.Flow is from: NorthEstimate approximate location of wetland as within the 0.5 floodplain.**(ii) Chemical Characteristics:**

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain:

Identify specific pollutants, if known:

(iii) Biological Characteristics. Wetland supports (check all that apply):

- ☐ Riparian buffer. Characteristics (type, average width):
- ☐ Vegetation type/percent cover. Explain:
- ☐ Habitat for:
- ☐ Federally Listed species. Explain findings:
- ☐ Fish/spawn areas. Explain findings:
- ☐ Other environmentally-sensitive species. Explain findings:
- ☐ Aquatic/wildlife diversity. Explain findings:

3. Characteristics of all wetlands adjacent to the tributary (if any)All wetland(s) being considered in the cumulative analysis: 0.5

Approximately () acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

<u>Directly abuts? (Y/N)</u>	<u>Size (in acres)</u>	<u>Directly abuts? (Y/N)</u>	<u>Size (in acres)</u>
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Summarize overall biological, chemical and physical functions being performed:

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D: The subject tributary is a small ephemeral drainage with an ordinary high water mark averaging 5 feet in width. Estimated discharge volumes at Outfall 009 (which includes the subject tributary plus the contribution from the Northern Drainage) is approximately 12 cfs for a 1-year, 24-hour flood event, 49 cfs for the 10-year event and 100 cfs for the 100-year event. The downstream TNW (upper limit of tidal influence on Calleguas Creek) is approximately 28 miles downstream. The total drainage area of the tributary represents approximately 0.03% of the watershed draining to the downstream TNW. Soil testing within the channel and surrounding watershed have revealed elevated levels of heavy metals (lead, cadmium, copper and/or mercury) as well as dioxin at one location. The tributary therefore has a significant nexus to the downstream TNW by virtue of its potential to deliver contaminants downstream.
2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:
3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
☐ TNWs: linear feet width (ft), Or, acres.
☐ Wetlands adjacent to TNWs: acres.
2. **RPWs that flow directly or indirectly into TNWs.**

- ☐ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial:
- ☐ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:

Provide estimates for jurisdictional waters in the review area (check all that apply):

- ☐ Tributary waters: linear feet width (ft).
- ☐ Other non-wetland waters: acres.
- Identify type(s) of waters:

3. Non-RPWs⁸ that flow directly or indirectly into TNWs.

- ☐ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

- ☐ Tributary waters: 1,200 linear feet; 5 width (ft).
- ☐ Other non-wetland waters: acres.
- Identify type(s) of waters:

4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.

- ☐ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
- ☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:
- ☐ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.

- ☐ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.

- ☐ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres.

7. Impoundments of jurisdictional waters.⁹

As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.

- ☐ Demonstrate that impoundment was created from "waters of the U.S.," or
- ☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
- ☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):¹⁰

⁸See Footnote # 3.

⁹To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

¹⁰Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA Memorandum Regarding CWA Act Jurisdiction Following *Rapanos*.

- ☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.
- ☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
- ☐ which are or could be used for industrial purposes by industries in interstate commerce.
- ☐ Interstate isolated waters. Explain: _____
- ☐ Other factors. Explain: _____

Identify water body and summarize rationale supporting determination:

Provide estimates for jurisdictional waters in the review area (check all that apply):

- ☐ Tributary waters: _____ linear feet _____ width (ft).
- ☐ Other non-wetland waters: _____ acres.
Identify type(s) of waters: _____
- ☐ Wetlands: _____ acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

- ☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
- ☐ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
 - ☐ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
- ☐ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain: _____
- ☐ Other: (explain, if not covered above): _____

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

- ☐ Non-wetland waters (i.e., rivers, streams): _____ linear feet _____ width (ft).
- ☐ Lakes/ponds: 0.155 acres.
- ☐ Other non-wetland waters: _____ acres. List type of aquatic resource: _____
- ☐ Wetlands: _____ acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

- ☐ Non-wetland waters (i.e., rivers, streams): _____ linear feet _____ width (ft).
- ☐ Lakes/ponds: _____ acres.
- ☐ Other non-wetland waters: _____ acres. List type of aquatic resource: _____
- ☐ Wetlands: _____ acres.

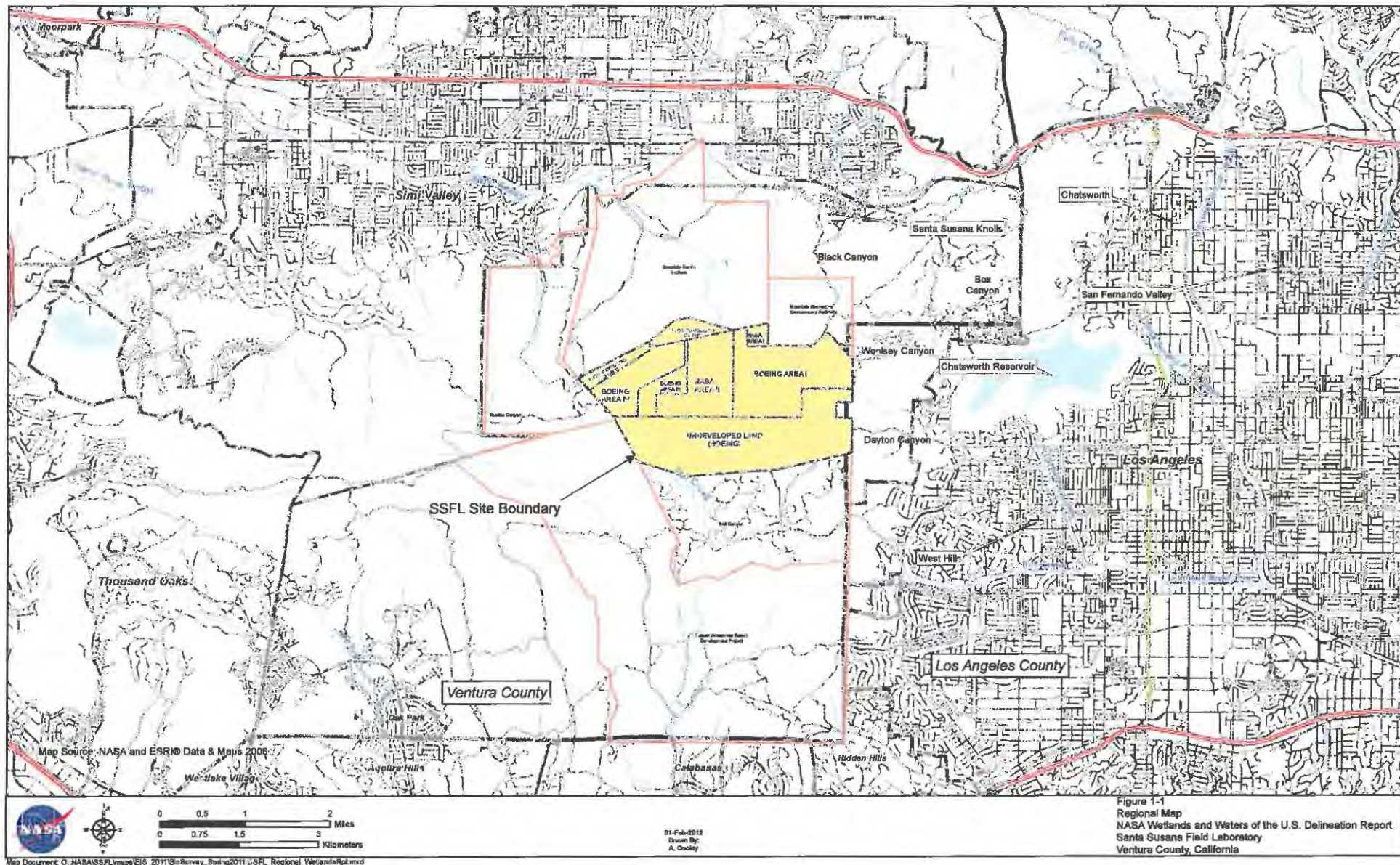
SECTION IV: DATA SOURCES.

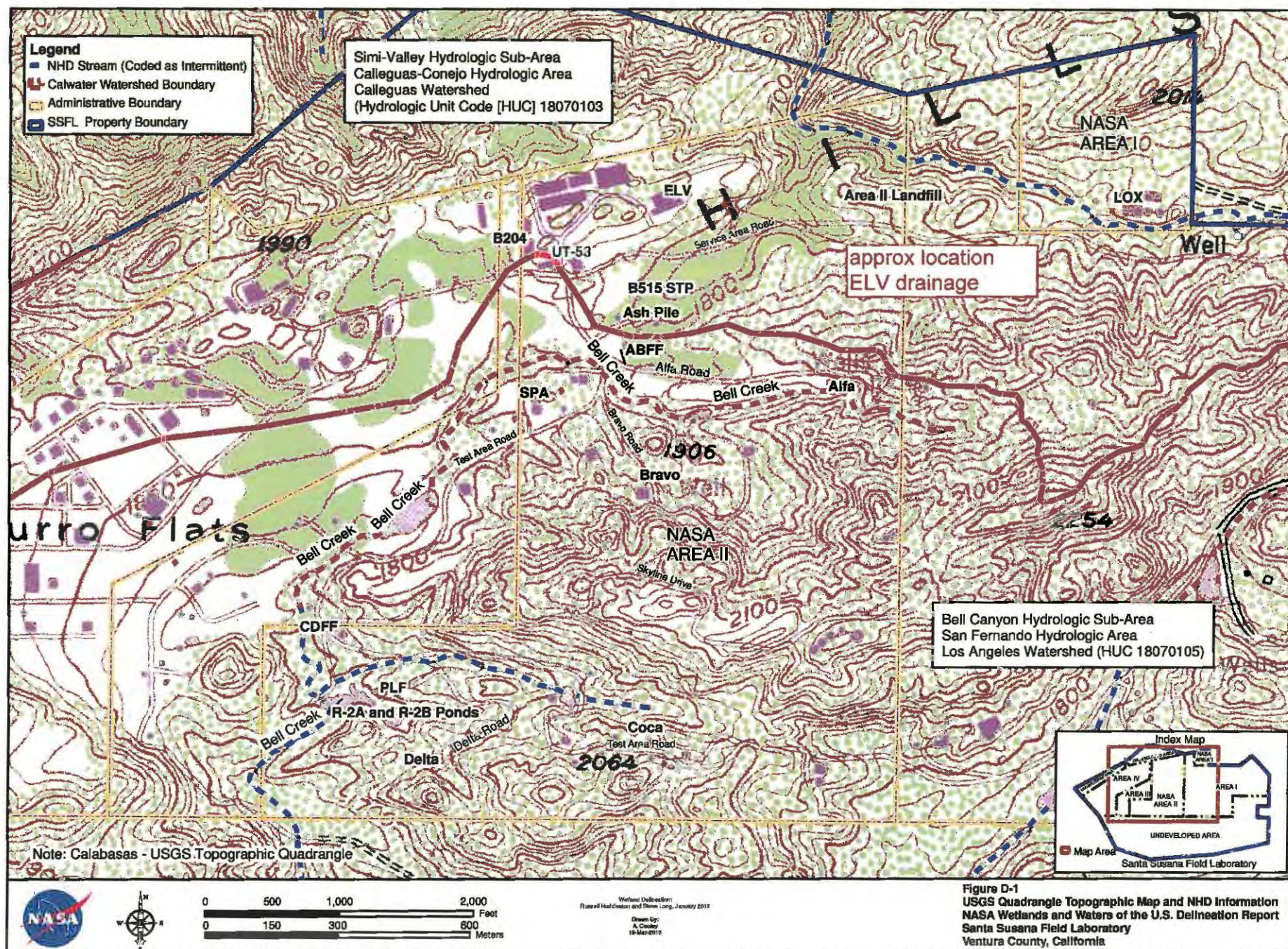
A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):

- ☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant:
- ☒ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
 - ☒ Office concurs with data sheets/delineation report.
 - ☐ Office does not concur with data sheets/delineation report.
- ☐ Data sheets prepared by the Corps:
- ☐ Corps navigable waters' study:
- ☐ U.S. Geological Survey Hydrologic Atlas:
 - ☐ USGS NHD data.
 - ☐ USGS 8 and 12 digit HUC maps.
- ☐ U.S. Geological Survey map(s). Cite scale & quad name: _____
- ☐ USDA Natural Resources Conservation Service Soil Survey. Citation: _____
- ☐ National wetlands inventory map(s). Cite name: _____
- ☐ State/Local wetland inventory map(s): _____
- ☐ FEMA/FIRM maps:
- ☐ 100-year Floodplain Elevation is: _____ (National Geodetic Vertical Datum of 1929)
- ☐ Photographs: ☐ Aerial (Name & Date): _____
or ☐ Other (Name & Date): _____
- ☒ Previous determination(s). File no. and date of response letter: file no SPL-2009-412-AJS (4/27/2010).

- ☐ Applicable/supporting case law:
- ☐ Applicable/supporting scientific literature:
- ☐ Other information (please specify):

B. ADDITIONAL COMMENTS TO SUPPORT JD: The subject tributary is a small first order drainage channel with an average OHWM width of 4 feet. The drainage area is roughly 67 acres. Flows from the tributary pass through the Outfall 009 water quality sampling station installed by the applicant. Data from the sampling station (2004-2007) showed exceedences of permit limits of copper on one occasion, lead on 2 occasions and a dioxin congener on three occasions. Soil sampling within the drainage area has identified elevated levels of heavy metals and dioxin. Based on these results, the subject tributary appears to have a significant nexus to the downstream TNW (upper limit of tidal influence on Calleguas Creek) based on the potential to deliver contaminants downstream.







End of Appendix G

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